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EDITORIAL COMMENT

As promised last month we have included in this issue a full catalog of books published by Computer Publishing Enterprises, not all these books relate to the TRS-80, but they are all written in simple laymans terms and many will be of use to you if you own either one or both types of systems.

One thing that Computer Publishing Enterprises prides itself on and that is making sure that the books that it publishes have the least amount of technical language and are easy to understand by any computer user regardless of their experience level. The Other thing that distinguishes this line of books from other computer books is their price. You will find the same information in these books as you find in books that sell for $19.95 to $29.95, but at a low, low $8.95 or less.

We have offered their books that we felt related to the TRS-80 computers for several years now, but felt that you two system owners should know about the other great books that this publisher has to offer.

Because these book descriptions take up four valuable pages of this issue, this will be the only issue that you will find them listed in. We will not print them in future issues, so if you don't place your order now, hang on to this issue for future reference. But we are sure there are some of these books that you will want to add to your library right away.

Evidently our April 12th deadline for the MagicDraw $100 contest was a little early to give you time to learn a program of this type well enough to enter a contest. So we are extending the deadline date to June 14th. So get those magic mice moving!

May
1993

MS-UTILITIES SPECIFIC COMMAND EXAMPLES

by David P. Miller

MS-Utilities Specific Command Examples

MSCOPY/CMD: MS-DOS to TRS/LSDOS
The MS-Utilities use TRS/LSDOS type commands, but filenames referring to files located on MS-DOS diskettes are constructed using MS-DOS rules. This generalization may help in understanding how to use the MS-Utilities. To copy a file called "MYFILE.DOC" FROM an MS-DOS diskette in drive B: (TRS-80 drive :2) TO a TRS/LSDOS diskette in drive :1 use the command:

MSCOPY B:MYFILE.DOC :1

Note the period is used as the separator for MS-DOS files, and (importantly) the colon PRECEDES the TRS-80 drive specifier but FOLLOWS the MS-DOS drive specifier. To copy a set of files with the extension ".TXT" using the same drive setup:

MSCOPY B:*.TXT :1

Note that the asterisk ("*") is the MS-DOS 'wildcard', used much the same as the TRS/LSDOS dollar sign ("$") 'wildcard'. In practice, most of the MS-Utilities use these two characters, along with the question mark ("?") interchangeably. You may copy files FROM (but not to) subdirectories (shown in the MSDIR output). To copy a file called "POETRY.DOC" from the subdirectory called "DATA", which resides in the subdirectory called "CMDR", which in turn resides in the subdirectory called "ST_TNG" using the same drive setup as above, you would use the command:

MSCOPY B:\ST_TNG\CMDR\DATA\POETRY.DOC :1
(Typed all in one command line.)
Note that the backslash ("\") is typed by holding the [CLEAR] key and pressing the normal slash, and the underline ("_") is obtained with the [CLEAR][ENTER] combination.

MSCOPY/CMD: TRS/LSDOS to MS-DOS
Using the same drive setup as above, you could copy the file "MYFILE/DAT" FROM the TRS/LSDOS drive TO the MS-DOS drive with the command:

MSCOPY MYFILE/DAT:1 B:

Or copy all files with the extension "/FLF" with the command

MSCOPY $/FLF:1 B:

MSDIR/CMD:
MSDIR is used in the same way as the TRS/LSDOS "DIR" command with the following exceptions: a specific group of files is selected for display by construction of a filename/extension 'mask' and limits by date, time, or other attributes are not supported; you may specify a pathname (subdirectories) as with MSCOPY; and the drive specifier will be an MS-DOS letter. To display all files in the "WORKSHOP" subdirectory ending with the extension "FRM", use the command:

MSDIR B:\WORKSHOP*.FRM

and add any parameters you wish to control printing, screen pausing, and suppression of allocation information. A specific file or a group of files may be specified depending upon the file specification used ("*.FRM" shown above).

MSFORMAT/CMD
Formatting a diskette requires only that you determine which drive contains the diskette to be formatted and which format you wish to use. To format a 180K diskette in drive :2 on your TRS-80 use the command:

MSFORMAT B: (F=180)

To format a 360K (double sided 5 1/4 inch):

MSFORMAT B: (F=360)

To format a 720K (double sided 3 1/2 inch) on drive :3 use the command:

MSFORMAT C: (F=720)

GENERAL NOTES:
All spaces seen in the above command are REQUIRED. For example, you must separate the drive specifier from the left parenthesis with a space in the MSFORMAT command. The Drive/Path/Filename/Extension combination used to specify a file on an MS-DOS diskette will NOT have any spaces, but will be separated from any other components of the command with spaces.

Single-drive copies are NOT supported. Users of TRS-80's with only two drives face a special situation; Drive :0 must contain the system files, and will be the source or recipient of any files for the TRS/LSDOS drive specifier in the MSCOPY command. Drive A: (TRS-80 drive :1) will be the source or recipient of any files for the MS-DOS drive specifier. To accomplish effective transfers, you must therefore make a minimum system diskette to place in drive :0 that contains the system files and will receive any files copied FROM the MS-DOS diskette, and will contain the source files to be copied TO the MS-DOS diskette. To make such a diskette, create a backup copy of your system diskette, place the BACKUP copy in drive :0, and issue the command:

PURGE :0 (I,Q=N)

This will remove all files except the system files. Now copy the MS-Utility files to this diskette as indicated in the instructions. To use the MS-Utilities, keep this newly-created diskette in drive :0 and place any MS-DOS diskettes in drive :1. Any files to be copied to an MS-DOS diskette will have to be placed on this "working MS-Utility" diskette before transfer, and any files copied from an MS-DOS diskette should be copied to this diskette using the MSCOPY command. After the file transfer(s) have been completed, you may then use the resulting diskettes as appropriate for the intended system.
-David P. Miller

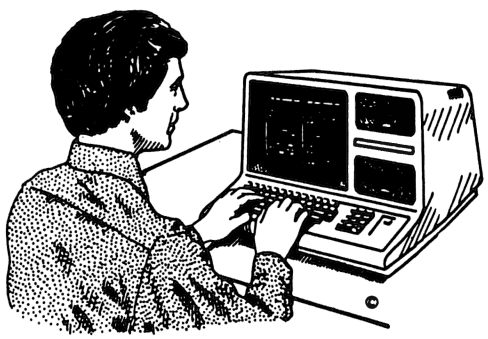
FOUR PART BASIC Part Three
by Robert Knowles

(See program listing number two.)

We can put it in and get it out but what if your hard at work and some one comes along and wants you to stop that and do something else, you close the file in the middle and go on to something else but then you must come back to the file and finish it, what do you do? You could start over again but thats a lot of hard work so you use the extend program. The extend program is a real life saver, you must finish the line you are working on because extend wont pick up in the middle of a line and make note of just where you did stop and the extend program will carry on as if you didn't stop at all. The name is very important, you must always be aware of what you are doing. The name must match so the extend program will extend the program that you want to extend.

Line 500 is the name of the program, 505 is to clear the screen, 510 is to open the file but this time we must open as E for extend then 1 for buffer and the name, we don't always have to use buffer 1, there are 15 other buffers you can use, 520 is just instructions, 530 This is why it is so important that everything is the same, then if you must extend the file then it will match the file you are extending, you should always try to do the best job you can, a lot of times people only see your work and you are known by your work. I always put the check number on the left and the hyphen is under the R in period the $ one space before paid and the / falls at the P in the second paid. if everything is always the same then there should be no problems, but if there is a mistake it can always be fixed with a text editor so there is no reason to get upset, if you make a mistake and see it to late to fix then go on and finish what you are doing then after you close the file put it on a text editor and fix it. 540 is the same as 530, 550 line input will keep asking for more information until you put DONE on the last line. 560 instructions again 570 you must tell the program what to do with the line you just typed, the buffer is a little small, it will hold three lines then you can hear it being put on disk, 580 sends the program back to 550 for more information, when finished you type DONE, 590 you must close the file.

-Robert Knowles



MS-UTILITIES A REVIEW
by David Goben

(MS-Utilities written by David P. Miller $30.00 + $4 (S&H) from Computer News 80 For Model 4 LS-DOS 6.x.x).

David Miller is at it again. He sent me a copy of his latest creation. I have to keep checking it to be sure it isn't a God-send instead.

I am like many of you. I have both TRS-80 and MS-DOS equipment. And this often requires that I move files between computers. For example, moving my Small C creations from the TRS-80 to the MS-DOS computer for compilation there, or visa-versa. Graphics files is another biggie on my list.

The problem has always been the method of transferal. My first method of years long gone by was to utilize a null modem and fight with terminal programs on both machines. My second approach was to obtain the then state-of-the-art transferal programs to allow me to process the data on only one machine (a great improvement). But the thing I hated most about those programs was that I had to keep reconfiguring them for the various disk formats of either machine. This becomes even more of a problem when working with both 3-1/2" and 5-1/4" disks, and having to keep reconfiguring source and destination drives.

The day I received DAVE'S MS-UTILITIES, all those problems disappeared. This package consists of four Model 4 programs: MSDIR, to obtain directory listings of an MS-DOS disk, MSCOPY to transfer programs to or from the TRS-80 and MS-DOS formats, MSFORMAT to format an MS-DOS disk on the TRS-80, and LFEOF, a program to adjust a file's logical record length if it isn't 256.

The first thing you must do when you open the package is to copy the programs onto a working copy of your system disk, or as I do in my case, a utilities disk which I keep mounted when running my computer, or in one of my hard disk partitions. Regardless, they should be stored in a lower-numbered drive than the drive you plan to use for transferring MS-DOS data to or from, simply because if the system has to search for the drive that contains the programs, and an MS-DOS disk is mounted in a drive number lower than where they are located, you can be assured that the computer will hang because it cannot derive comprehensible format information from the MS-DOS disks. This does not indicate a problem with the utilities, but rather a natural consequence of alien disk formats.

Once the utility programs are copied, the next thing you should do is sit down and read all the instructions, if you have not done so already. One thing I liked right off with the programs is that if you simply enter their names without any parameters, they will list a screen full of help, to remind you how to use the programs. Another thing is that if you accidentally enter a drive number that corresponds with a hard disk partition, that you will be reminded by the program that you can only specify a floppy drive.

The utilities work with 3 basic MS-DOS disk formats: 180K, 360K, and 720K. These formats correspond to single-sided double-density 40-track, double-sided double-density 40-track, and double-sided, double-density 80-track, respectively. These are the standard formats available for MS-DOS. Other lesser formats are so antiquated as to be in total disuse, and should not be missed, such as the disk-wasteful 160K format. Even 180K is really a thing of the past that no one except perhaps the most ardent of stubborn die-hards use as a regular part of their MS-DOS work, or, on a friendlier note, those who still have only 1-sided drives on their TRS-80. The newest standards, 1.2Meg, 1.44Meg, and the emerging higher density formats, cannot currently be used on TRS-80 equipment, as the TRS-80 is not fast enough for the data transfer rate required to support them.

MS-DOS, like its CP/M ancestor, uses letters instead of numbers to designate drive names. With the MS-Utilities, TRS-80 drives :1 through :7 correspond to MS-DOS drives A: through G: (note that logical drive :0, the system drive, is not [as it should not be] used for MS-DOS input/output). The best part of these utilities is that they =do not= ignore the way that you have the logical drive numbers assigned on your system, if you have, like me, changed them because of

the presence of a hard disk drive. For example, on my standard system I have logical drives :0 through :3 assigned to hard disk partitions, logical drives :4 and :5 to my internal 5-1/4" floppy drives, and logical drives :6 and :7 assigned to my external 3-1/2" drives. With the MS-Utilities, this means that my internal 5-1/4" drives correspond to MS-DOS drives :D and E:, and my external 3-1/2" drives correspond to MS-DOS drives F: and G:, respectively. For me, this is a load off my mind, as with the other utilities (SuperCross and HyperCross) I had been using for several years, they ignored such assignments and made figuring things out a whole lot harder.

To quickly review, to clear it up for your own reference, here is a correspondence chart between TRS-80 logical drives and their corresponding MS-DOS drives:

:0 -- none
:1 -- A:
:2 -- B:
:3 -- C:
:4 -- D:
:5 -- E:
:6 -- F:
:7 -- G:

I fell in love with these utilities the first time I actually tried using them. I inserted an MS-DOS disk into a drive, and used MSDIR to read its directory. The thing that impressed me the most was that I did not have to fumble around with setting configurations switches to define disk formats, or lock in specific drives for exclusive use of the MS-DOS disks. This is almost too easy.

You can even designate "partspecs" to display only certain types of files. For example, suppose that I wanted to look at all the files within a subdirectory on the disk called ASCII on an MS-DOS disk that have a file extension of ASC. Suppose further that I have this disk mounted in drive :4. From the DOS ready line I would enter:

MSDIR D:\ASCII\$.ASC

This command tells MSDIR to look on drive D: (TRS-80 logical drive :4), look in the subdirectory called ASCII, and view all files with an extension of .ASC (notice that MS-DOS uses a period (.) instead of a slash (/) to mark file extensions). The dollar sign ($) is a "wildcard", indicating that anything can be in its place.

You can also specify parameters to tell MSDIR to look at system files, to not show allocation information (like using CAT), to print the directory listing to the printer, and to scroll the screen without pausing when it becomes full.

My favorite utility is MSCOPY. This is the utility that can transfer files both to and from TRS-80 and MS-DOS formats. Suppose I wanted to copy a TRS-80 file called AMNOVEL/TXT in floppy drive :1 to an MS-DOS disk in Drive :2 (MS drive B:). I would use the following command:

MSCOPY AMNOVEL/TXT:1 B:

Or if I wanted to copy a file called AMNOVEL.TXT from a subdirectory on the MS-DOS disk called GREAT in drive :2 (B:) to TRS-80 drive :1, I would use the command:

MSCOPY B:\GREAT\AMNOVEL.TXT :1

Although MSCOPY can copy a file from an MS-DOS subdirectory, it cannot copy a TRS-80 file =to= an MS-DOS subdirectory. But hey! Correct me if I'm wrong, but there is no other TRS-80 based program that can copy files from an MS-DOS subdirectory like what MSCOPY can. So we must count our blessings.

MSFORMAT allows me to format fresh MS-DOS disks. Normally I would do this on the MS-DOS machine, but suppose I did not have an MS-DOS machine but a friend did, and I wanted to send him a copy of a file I was writing? It would have to be written in a format that his system could read. This utility also comes in handy when one is copying files to MS-DOS, and we run out of destination disks. Just whip out MSFORMAT and create some more.

MSFORMAT is easy to use. Just decide what drive and what format you want to use (180K, 360K, or 720K). For example, suppose that I wanted to format a 360K disk on floppy drive :1 (MS drive A:), I would enter the command:

MSFORMAT A: (FORMAT=360)

It's that easy. By the way, notice that that FORMAT= parameter can be shorted to just F=.

ADDITIONAL NOTES

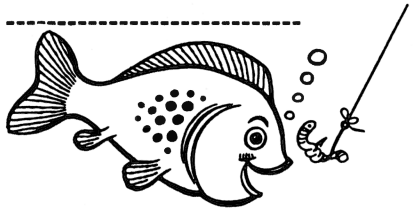
The MSDIR, MSCOPY, and MSFORMAT programs will not act immediately upon your commands, but will prompt you to insert the MS-DOS disks in the designated drives before preceding. This may seem like a hassle, but is actually quite handy, because if you wait until the prompt to insert an MS-DOS disk into a drive, you will never have a problem with the computer hanging up if you misstype a command and the system searches through all the drives for the miss-named file. If an MS-DOS disk was mounted, the computer would require a reset to get back into operation, because it would have gotten confused with the uncooperative format of the MS-DOS disk.

If you are working on a Model 4 with an XLR8er installed, you will need to either set the Memory Wait States value of the XLR8er to 2 when working with MSCOPY, or run the system using a non-XLR8er-patched boot disk. I've notice that 1 out of every 2 times that sectors on an MS-DOS disk get written incorrectly if Memory Wait States is set to 1 or 0. Working with David Miller, we were unable to patch in delays that would prevent this. But adjusting the speed of the XLR8er is easy enough to do, anyway.

CONCLUSION

If you have both TRS-80 and MS-DOS equipment, and you must transfer files between the two, then DAVE'S MS-UTILITIES =is= for you. Even if you have some other transferal program, or even waste time using serial communications programs, using these utilities even once will give you cause to shelf any other utility package you may have used to get the job done. I'm certainly sold, and I give my personal recommendation to =anyone= to use this most easy-to-use package. It is a standard part of my library.

-David Goben



MODEL 4 SMALL C - A REVIEW
by Richard VanHoutem

A couple of years ago, I bought the book, "A Small C Compiler (2nd Edition)" by James E. Hendrix, which included the MSDOS version of Small C, and thought seriously about porting it to the Model 4, but got distracted into other things. Thankfully, David Goben was more persistent than me, and he has brought the project to fruition, with probably more success than I would have.

The Model 4 Small C compiler package consists of the compiler itself (SCC/CMD), and optimizer (SCCOPT/CMD), a macro-compiler (MAC/CMD), and an object file linker (SMLNK/CMD). In addition, an object file librarian (SMLIB/CMD), a source code archiver (AR/CMD), a make utility (MAKE/CMD), a machine instruction table compiler for customizing MAC/CMD (CMIT/CMD), and full source code to everything except MAKE/CMD. It comes on 3 single-sided double-density disks, but everything on the second two disks and several files on the first are source code and can be deleted from your working disk, leaving space on a 180k diskette for some of your own source code. The only other thing you need to write and compile C programs is a text editor, and TED is perfectly adequate for that.

SCC/CMD compiles a subset of the full C language. It has no support for floating point types, structures, unions, or integer types longer than 16 bits. (It recognizes the "long" reserved word, but treats long ints as 16 bit integers, rather than the more usual 32 bits. It's "standard" library includes most of the standard input/output and string manipulation functions. Left out were all math functions, most of which would require floating point support.

The output of the compiler is in assembly language files with the extension "MAC". It says at the start of chapter 12 of the manual that these files are compatible with Microsoft's Model 4 MACRO-80 assembler and MISOSYS' MRAS assembler as well as MAC/CMD. I have no experience with MACRO-80, but MRAS is not happy with these files on 2 counts: the lower case labels (MRAS wants all input in upper case, except for quoted strings and comments) and the pseudo-op EXT which is used to declare

labels as external (MRAS uses EXTRN instead). Even if you edited the assembly files to fit MRAS' conventions, you wouldn't be able to link the resulting /REL file with the provided libraries, because of the changed case of the external references.

MAC/CMD can be customized with CMIT/CMD to use different sets of opcodes. I8080/MIT and Z80/MIT are included for this purpose. I found that MAC/CMD didn't support the indexed addressing modes without stating the offset, i.e., you had to use LD A,(IY+0) instead of LD A,(IY), so I edited Z80/MIT to support these. I had to re-compile MAC/CMD and CMIT/CMD to use a larger instruction table buffer size, but I ended up with an assembler that better fits my programming habits. It still isn't perfect... you can't use an opcode or a pseudo-op as a label, because it doesn't insist on spaces or tabs before the opcode, and insists on a colon after a label. Then again, MAC wasn't designed to be primarily a stand-alone assembler, and lots of niceties used in other macro assemblers have been left out. It does its job within the Small C package admirably. The only problems other than syntax that I have had with it were caused by a typo I made in Z80/MIT.

SCCOPT/CMD seems to do a good job of optimizing the assembly output, but it is easily the slowest part of the process. When I re-compiled CMIT/CMD and MAC/CMD, it took over 3 hours to complete (with all files on a hard drive), and I suspect that at least half of that time was spent in SCCOPT. See program listing 3 for a replacement for the SCC/JCL that David presented last month that only runs SCCOPT if an O parameter is given, and program listing 4 for a replacement for the CC that David presented last month that passes the O parameter to SCC/JCL if a -O switch is used on the command line. One problem I have with SCCOPT is that the output files don't use tabs or spaces to indent the opcodes, and uses only a single space between the opcode and the operand. This isn't a problem as long as you're only passing it on to MAC, but if you want to take a look at it (to trace down bugs or to do some manual optimization beyond what SCCOPT is capable of), the output files are much less readable than traditionally formatted assembly language files.

SMLIB collects the output /REL object files into /LIB library files with /NDX index files. The /NDX files are required for SMLIB and SMLNK to find the start of the individual modules in the /LIB files. These /LIB files are compatible with the MLINK linker that comes with MRAS (which will ignore the /NDX files).

SMLNK does a good job of linking. You can change the base address of the output file with a command line switch, and tell it to use a disk file to hold everything except the symbol table for those really large projects. I'd like it better, though, if I could tell it where to create this file, though, since my :0 drive is usually nearly full.

AR/CMD maintains the source code /ARC archives. These should not be confused with the compressed archives with the same extension found on BBS's; these are essentially concatenated text files. AR/CMD is rather slow in operation; I found it to be quicker to extract files by loading the /ARC into the SAID text editor and deleting everything except what I wanted to get at, unless the member file I wanted was toward the end of the archive and the archive was longer than SAID's buffer space, in which case I had to wait on AR. When extracting, if not given a list of files, AR will extract everything to the first available drive... again, I'd prefer a method of telling it what drive to use (when extracting individual files, you can give the drivespec with the filename.)

MAKE/CMD is the best part of the package... easily worth the price of the whole package to someone working on a large, multiple source file project. For those not familiar with make utilities, it automates recompilation of large projects by only re-compiling those portions that have changed. This make has nearly all the flexibility that I wanted to put into a make utility that I was thinking of writing (another unfinished project...): you can specify more source files than will fit on a single line, and use multiple command lines for each destination file. It works best with LSDOS 6.3.x, since that timestamps the files down to the minute, and previous versions of TRSDOS only stamped the day, so that if you changed MYPROG/C right after compiling it, MAKE would not be able to tell that it was newer than MYPROG/CMD

under TRSDOS 6.2.x or earlier. I wish I had had this utility when I was porting EMPIRE from Unix Fortran source to Model 4 assembly... I had to make do by editing a JCL before re-assembling and re-linking.

The manual covers Small C fairly well, but coverage of the included utilities is a bit sketchy. In particular, there is no mention of how the /MIT tables (used by CMIT to customize MAC) should be constructed. You can tell a lot from examining the I8080/MIT and Z80/MIT files, but even after talking to David over the phone, I still have some unanswered questions about them.

All utilities will give help if invoked with "-?", but the help is limited to one line, listing all the switches. If you can't remember what a switch does, you'll have to refer to the manual.

Over all, the package is a good buy for a programmer who is new to C, and intimidated by the number of library functions in other C packages, and to the experienced programmer who wants to learn about compiler design by studying and modifying the source code (or who wants a good MAKE utility). While it can be used as a development compiler, it is not really intended as such, and if that is your need, you should get a copy of MC while it is still available.

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I'm currently hard at work on creating an add-on library for Small C, to provide functions not in its standard library. Included in it will be such things as:
cursor control
mouse interface
high and low resolution graphics
and other things as I find time for them. Look for a product announcement next month.
-Richard VanHouten

A VISIT WITH DAVID GOBEN
by David Goben

Boy, have I got a lot of territory to cover. Also, I will be spending a lot of time dealing with Small C this month, providing an extension library that supports 32-bit integers that can have values up to 4,294,967,296 (65536 squared). But this is the last month where I will do such extensive coverage. In future columns I will return to providing general interest tips and comments to the less technical-minded application user. Any future coverage of Small C, or C in general, will only be provided as you, the readers, request it.

FAST SOFT FONT DOWNLOADS

Many of you have purchased the Model 4 SuperSCRIPSIT and SCRIPSIT Pro soft font packages from CN80. A utility that comes with that package is a program called DOWNLOAD/CMD, which will download soft fonts into your laser printer. That same downloader also works with DeskJet printers, and any other printer that supports the PCL 4 language (and above). If you do not know what Printer Control Language 4 is, then you probably don't have a printer that supports it.

This download program has been called the fastest downloader ever written. It is even faster than the MS-DOS soft font downloaders. But now there is a new version out that is being sold as a separate unit by CN80. This program, also called DOWNLOAD/CMD (internally called FDLOAD for Fast DownLOAD), works over =twice= as fast as the version supplied with the soft fonts. This new version will download soft fonts so fast that you may wonder if they were even loaded. This program uses the same command syntax and parameters as the version which is still supplied with the soft fonts, so there is nothing new to learn. The package is called FAST SOFT FONT DOWNLOADER, and is available from CN80 for $10 plus the usual $4.00 shipping and handling charge. To use it, simply copy it to your work disk, or copy it onto working copies of your soft font disks, replacing the DOWNLOAD/CMD program already there. After that, you can forget that you even have it, except that you may be constantly reminded that you do have it when you notice how fast your soft fonts load.

FOCUS ON ZIPCODES

There has been a question by a reader about what part of the zipcode programs featured in the September 1992 issue of CN80 actually handles printing the USPS bar codes themselves. Focusing on the ZIPCD9/BAS program listed on pages 23 and 24, you will need the data in lines 180 through 230 to store the various codes for each digit. This should be included in your initialization section. If the bar code is to be a self-contained string, it is to be placed in a string called ZIP$ as text characters, with an optional dash to separate the 4 extra digits of 9 digit zip codes from 5 digit codes. The code that translates these characters to Epson graphics is listed in lines 570 through 980. Be sure to take note of the use of the ENVL variable in line 800. This spaces the printer head over to the right. You may wish to eliminate this line if your program already positions the printer head prior to sending the bar code out.

MAGICDRAW TIP

One person has a need for pin-point accuracy when pointing the mouse pointer while using MagicDraw. He said he would like to use the zoom mode to position the cursor, save that position, zoom back out, and then use it. Actually, when you leave the zoom mode, the mouse pointer is positioned at the exact spot that it was pointing to while in the zoom mode.

You also may have noticed that the clipboard save file, MAGICDRW/BRD, already exists. This file is used whenever you wish to save the contents of the clipboard for a later session. If you have not yet saved any of your clipboard data to disk yet, you might try going into EDIT, load the clipboard, and then view it. I placed that picture of myself there to see if anyone would catch it. Apparently no one has thought about trying it.

BCX AND HIGH MEMORY

To cover some old ground, my BCX spreadsheet program requires that there be no high memory routines present. This is because BCX uses all of memory to handle its pointers. With 64 columns and 256 rows, this equals 16,384 cells. To keep track of these, a table of pointers is required. Each pointer is 2 bytes long, and so the table is 32,768 bytes long, or exactly 32K. This table resides in memory from 8000 hex to FFFF hex, or all of the upper half of memory. Although since writing BCX, I have subsequently figured out how to get around this, and to do fast processing of variable width columns, variable length records, extended text strings, and file linking, I'm not sure pursuing a BCX II version is yet worth it. Projects like this require several hundred hours of work, and I don't plan on doing all that work for only a small hand full of people. However, since BCX sales seem to continue to move along, I =may= reconsider my position. But right now, don't hold your breath. I simply mention this because a number of people have asked me about it. If I do, however, current BCX owners will be offered an upgrade option. But right now I am happy with BCX and all its power as it is.

LAIR OF THE DRAGON

For those of you who have purchased my LAIR OF THE DRAGON from MISOSYS: Feel the floor in the basement. Don't open the matchbox -- simply light a match. Taste the dust in the dwarf mines. Face off with the baby dragon with water and a shield. Give the mirror to the dragon. Examine the useless dynamite. Fill the dragon egg with gas. Dig in a sandy place to find something. Bury the dead. Etc. Etc.

No more clues, folks, so please do not ask for more. I won't give them. Because MISOSYS is closing it out at an incredibly low price, my royalty is next to nothing at all, and so there is no use providing it with support. Besides, MISOSYS has also stated that there will be no support for these close-out products.

This may be the most complex adventure ever written, but it is also incredibly easy if you simply make =careful= note of every description, or how something is worded. Also, be sure to examine every object you find. Crucial clues can often be derived from them. And no, a product being closed out does =not= mean that it will become public domain, unless =I= choose to do so. And I don't.

THE DOS COPY COMMAND

Here's a neat tip to those of you who wish to send information to the printer. The COPY command can do more than copy files between disks. It can also copy data to or from a device, or between devices. This has

always been documented, but few people ever really notice it. Even myself.

The method I had often used to copy a file to the printer in an exact byte for byte manner was to use the command:

LIST file (P,A8,T=)

This command listed the file to the printer (P) instead of the screen, allowing 8-bit byte transfers (A8) instead of the usual 7-bit, and suppressed tab expansion (T=). But this =same= thing can be accomplished by using the simpler command:

COPY file *PR

This command copies the file to the printer device (*PR).

This feature has a lot of usefulness for those of you who wish to initialize your printers. A lot of users have written or use a BASIC or command program that will set their printer up the way they want them. But by taking advantage of the ROUTE and COPY commands, you can speed this process dramatically.

The first thing we want to do is to create a disk file that contains the codes for the printer. We can do this by issuing a command like:

ROUTE *PR PRSETUP/INI (R)

This command will route the printer output to a file called PRSETUP/INI, and makes sure that the pointer is rewound to the start of the file if it already exists. Next you go into your BASIC program, or whatever program you are using to initialize your printer. Run your program as usual to set the printer up. The data will be sent to the PRSETUP/INI file instead of the printer. When you are finished, return to the DOS prompt and enter the command:

RESET *PR

This will close the PRSETUP/INI file and reset the printer for normal output. You now have a file that can be copied to the printer directly from DOS using the command:

COPY PRSETUP/INI *PR

This line may be useful to include in your start-up JCL file. This method sure makes initialization a lot faster.

You can also use this method with laser and deskjet printers. If you have a set of soft fonts that you are always downloading into the printer, route the *PR device to a disk file such as DOWNLOAD/INI, and then use your download program as usual to "download" the soft fonts to the disk file. Next reset the printer using RESET *PR. From now on you can download all those fonts at once using the command COPY DOWNLOAD/INI *PR.

OH SAY CAN YOU C? (part 2)

I'm a busy guy collecting tutorial material for my Small C package. My aim is to make programming in C as easy as falling off a log. Those of you who have already obtained the Small C package will do well to list the /ARC, /C, and /H files out to your printers and examine how the code was put together. I have always learned a new programming language by examining someone else's code. It could also be a really big help for you, as well. If you are too impatient to wait for my tutorial manual, you can go to a bookstore and obtain a C tutorial book, keeping in mind the requirements of Small C when you go through the book.

I caught an error too late to correct in my last month's column. In the samples where I define the days of the week text to char arrays str1 and str2, instead of using str1= and str2=, I =should= have used str1[]= and str2[]=. I type those brackets so automatically anymore, I'm surprised I missed them when typing the column. Of course, this type of assignment would have worked if the char statement header had been removed, and str1 and str2 had already previously been defined as pointers to characters. Oh, well. Nice to know we all goof up once in a while.

Small C 1.2 Revision 70

The original release of The Model 4 Small C package noted the compiler as being release 69. Since then I have upgraded the compiler to work better with 2-dimensional array definitions, and to properly process indexed pointers that also use the pointer prefix (*).

In the FORMLTR/C program listing in my

last month's column, you may have noticed that I had explicitly defined the data[][] array, and also made a comment in the listing stating that 2-d arrays must be explicitly defined. By making a simple modification to the Small C compiler, I was able to change Small C so that you can now define the data array as:

int data[2][LINES];

instead of how it was defined in last month's program listing. This change also brings Small C more in line with the Full C specification for the definition of 2-d arrays (although the previous method is still legal and acceptable -- and in fact uses exactly the =same= amount of memory, but just required a bit more typing on your part).

A further simple modification was needed so that if a person had a 2-d array, but used indexing and the pointer prefix at the same time, such as in the form *argv[index++], for example, that this would work correctly. I was shoving Small C through the wringer recently, and found that the examples on page 141 in the Small C manual did not work properly. This was fixed so that now they will. It always amazes me how easy it is to correct problems in C programs, once you figure out what is going wrong. What I had figured would be a couple of all-night debugging sessions to fix these problems instead turned into one nice educational evening.

Small C 32-bit Integers

One person, a Full C user who openly admitted having no real interest in checking out Small C in the first place, quickly noted off the cuff that Small C is limited in that it could do no real number crunching for applications such as a mortgage amortization program or a check balancing program, indicating that dollar and cents calculations are very limited, he imagining perhaps that one would be forever confined by a maximum dollar value of $655.35 (an unsigned integer can have a value from 0 to 65535). How wrong can one get? You see, the real beauty in the ability to create one's own language extensions as we write our C programs (by defining new functions) is that we can =easily= overcome such obstacles in a rainbow variety of ways. Thus his words are bunk. His lack of C programming experience was shown not only by his limited insight, but also when he tried to demonstrate a "better" approach to accomplishing a task by using code that was both inefficient and wasteful, when more efficient and precise methods are readily available for both Small C and Full C. Give me a break, guy. I have been programming in Full C for over 9 year on various machines, and consider myself to be thoroughly versed in the language, but even with that, for the last 4 years that I have also been working with Small C, I still prefer to use Small C in most of my applications for the modest reason of its simplicity and profound versatility.

In respect to Small C's supposed numeric limitations, long integers of the 32-bit variety (4 bytes, or 2 words) were not incorporated into Small C because of the program code required to fully support such a feature as an =integrated= part of the Small C compiler, not because it could not be done, but rather because doing so would cause Small C not to be so very small. But this does =not= mean that such support is not possible. In fact, I have already written functions that will perform fully-supported 32-bit math: addition, subtraction, multiplication, division, and comparisons. With these extensions, one can use positive values from zero to 4,294,967,296. Or signed values from -2,147,483,648 to +2,147,483,647. I have incorporated these into functions called longadd(), longsub(), longmul(), and longdiv(). I have also included other support functions: lremain() will provide the remainder of a long division operation from the longdiv() function, lhexdec() will converts a 32-bit value to an ASCII string, atoli() will convert an ASCII string to a 32-bit value, lsgn() will return the signum value of a long integer, lscmp() will compare two signed long integers, lucmp() will compare two unsigned long integers, and dollar() will take an ASCII string and convert it into dollar format, where the right-most two digits will be used for the "cents" field (thus a value of 5 is considered $0.05, and 12345678 is considered 12,345,678 cents, or $123456.78). These functions are contained in a Small C library file called LONG/LIB, and LONG/NDX, its support file. These two files will be included in the next CN80 Disk Series disk. Please note that the code within these files is copyrighted, but you are free to use them for your own personal Small C applications, to include

linking them into your own Small C programs for distributions, without royalty payments to me. That said, let's see how to use them.

To set up a 32-bit integer field, you do so by creating integer arrays that are 2 deep. Thus, to create integer arrays called x, y, and z, you would use the statement:

```
int x[2], y[2], z[2];
```

Array offset 0 in these arrays contains the low order 16 bits (2 bytes), and array offset 1 contains the high order 16 bits of the value. Indeed, if you will be using signed values, you can test if a 32-bit value is positive or negative by testing the sign of array offset 1. For example, suppose you have an integer variable called "sign", and you wish to set it to 0 if x is positive, and non-zero if it is negative, you could use the following simple statement:

```
sign = (x[1] < 0);
```

The test, (x[1]<0), will yield true (non-zero) if the value of x is less than zero (negative), and assign that result to the variable sign. If x is zero or positive, then the comparison will yield false, and assign a null value to sign.

You could have also used the lsgn() signum function in this manner:

```
sign = (lsgn(x) == -1);
```

By the way, if you will be working with only positive values, you may like to instead define these variables thus:

```
unsigned x[2], y[2], z[2];
```

Assigning values to these variables is not very difficult. Simply assign the value to array offset 0. You may also wish to assign a null value to array offset 1 if you know that the high 16-bits have been altered previously, or especially if you are defining these variables locally within a function, rather than globally (before or between functions), because unlike global definitions, local definitions will not be initialized with null values.

Assigning values from 0 to 65535 to an array is easy. For example, to assign 65500 to x, you could use:

```
x[0] = 65500;
x[1] = 0;
```

The tricky part may be if you need to initialize an array with values greater than 65535. To do this, you might choose to do a little math on a calculator. For example, to initialize x with a value of 4138498, we could divide this value by 65536. This yields and integer value of 63. By subtracting 63 from our calculator's results, and then multiplying the fraction by 65536, we get 9730 (remember to round your results if the product is not a full integer -- for example, my result was 9729.999995). To verify, by multiplying 65536 times 63 and adding 9730, we indeed come up with 4138498. We would assign this value to x thus:

```
/* assign 4138498 to x */
x[1] = 63; /* high 16 bits */
x[0] = 9730; /* low 16 */
```

However, a =much easier= way to assign such a large value is available by making use of the atoli() function. atoli() was designed to translate user-entered values (normally typed from the keyboard or read from a file and stored in a text string) into a 32-bit integer value, it can easily be used to supply long integers with immediate values. To do the same task of assigning 4138498 to the x array without resorting to a calculator, we could have used the simpler statement:

```
atoli("4138498",x);
```

Ta-da! The same thing was accomplished. The down side is that this latter method uses a little more memory. Of course, it is a God-send when trying to assign negative values.

Going, on, suppose we had values stored in x and y, and we wanted to multiply them together and assign the result to z. We would use the longmul() function in the form:

```
longmul(x,y,z);
```

Afterward, integer array z will contain the result of multiplying arrays x and y together. This function also returns a pointer to variable z. The reason for this

returned address will be apparent shortly.

The same procedure is followed by the functions longadd(), longsub(), and longdiv().

Did you notice that we simply placed the names of the integer arrays as parameters to the function? By doing this, we are not sending the values (contents) of the arrays to the function, but rather the addresses of the arrays themselves. This way our function can access the entire 32-bit field of each array.

To convert our result in array z to a string, we need to set aside string space of at least 14 characters (10 for the digits, 1 for the sign (if used), 1 for the null end of string byte, 1 for the '$' symbol, and 1 for the '.' marker -- these last 2 are for if the dollar() function will later be used). To set aside string space for a character array (string) called str, we would use the statement:

```
char str[14];
```

Note that there is no need to initialize this array. Using this array, we could then convert the value in z to a string in str by using the statement:

```
lhexdec(z,str,0);
```

This provides the lhexdec() function with the address of array z, the address of the string str, and a sign indicator. The zero value used in this example will tell lhexdec() that the value should be translated as an unsigned positive value. If you use a non-zero value instead, and if the value is indeed negative (the high bit of array offset 1 being set), then a '-' sign will precede the string converted value.

For example, if z contained a value of 68362190, and we issued the statement:

```
lhexdec(z,str,0);
```

The str array will contain a string of characters reading "68362190", with a null byte terminator. Further, this function will return the address of str.

To convert this ASCII converted string to dollars and cents format, we could use the statement:

```
dollar(str);
```

The str array will afterward contain the string of characters "$683621.90", with a null byte terminator.This function also returns the address of str.

To demonstrate the versatility of C, and at the same time to provide a practical working example, consider this short Small C program:

```
/* define/init arrays */

int x[]={65511,0};
int y[]={59203,0};
int z[2];

char str[14];

/* main program */

main() {
  puts(
    dollar(
    lhexdec(
    longmul(x,y,z),str,0))));
  }
```

This short program assigns 65511 to x and 59203 to y at the same time these global arrays are defined. It also defines integer array z and our character array str (our string). We then display the product of multiplying x and y within our main() function. longmul() (and the other 3 long***() functions) return the address of the destination variable. This pointer is used by the lhexdec() function, along with str and 0, to derive an unsigned ASCII version of the value. This function returns the address of the string. This pointer is in turn used by dollar(), which converts the string to dollar and cents format. This function returns the address of the string, which is in turn used by the puts() function, which displays the data pointed to, and adds a carriage return to the end, sending it all to the screen.

Putting it all together, this short program simply displays:

```
$38784477.33
```

To fill out our discussion of these new functions, let us take another look at the atoli() function (Ascii TO Long Integer). It

is used in the form:

atoli(str,lintv);

where str is a pointer to a string that is assumed to be at least 12 characters long (though I use 14 as a general rule). Lintv is a 2-deep integer array that will contain our 32-bit value. This function will return the address of lintv. Notice, as had been shown earlier, that typing a string in place of a simple pointer still provides the function with a pointer to a string.

The long integer remainder function, lremain() will assign the remainder of a division operation performed by longdiv() to an integer array, and return a pointer to that array. For example, if we had four 2-deep integer arrays called w, x, y, and z, we could divde the 32-bit value in x by the value in y, storing its result in z, and assign the remainder (the portion left over) to w, using the statements:

```
longdiv(x,y,z);
lremain(w);
```

Note that the lhexdec() function also uses the longdiv() function, so if you will require the remainder from a long division, and will also be using the lhexdec() function, that you should use lremain() immediately after the division.

As one further example, suppose you wanted to assign to z the MODULO result (the remainder from a division) of dividing x by y. You could use the following statement:

```
lremain(longdiv(x,y,z));
```

Afterward, z will contain the remainder of dividing x by y. If you wanted to get really fancy, you could even define a new function called lmod(). For example:

```
/* long integer modulo division */

lmod(arg1,arg2,dest) int arg1[],arg2[],dest[]; {
  return(lremain(longdiv(arg1,arg2,dest)));
  }
```

This function could be called using the statement:

```
lmod(x,y,z);
```

and will perform the duo function of longdiv() and lremain() in a much cleaner-looking fashion. Also, this function will return the return value of the lremain() function; the address of the destination array (z in this example's case).

The long integer signum function lsgn(), is used in the form:

```
lsgn(lintv);
```

This function returns a value of -1 if the 32-bit value stored in the integer array indicated by lintv is less than 0, return 0 if lintv contains a null value, and returns 1 if lintv is greater than zero. It is assumed that lintv is a signed integer array storing a 32-bit value.

The functions lscmp() and lucmp() are used to compare two 32-bit signed or unsigned integer values, respectively. Suppose that two 32-bit values contain in signed integer arrays x and y are to be compared. You would use the lscmp() function thus:

```
lscmp(x,y);
```

This function will return -1 if x is less than y, return 0 if x equals y, and return 1 if x is greater than y. The lucmp() function is sued similarly, except that it is used on unsigned values.

Obviously, within your own application you can use whatever variable names you choose as parameters to the functions, as long as they conform to the storage type required (int or character array). These functions will be much more fully defined, along with their complete source code, in the tutorial that I am currently outlining. The tutorial will also contain many other functions to make DOS interfacing much easier, to include lo-res graphics and hi-res graphics, disk and file I/O, mouse interfacing, text window support, and extended memory support. This is because I plan to extend the tutorial to also include "power" tips and support.

To link LONG/LIB into your Small C programs, link it using the command:

```
SMLNK program:1 LONG/LIB:1 C/LIB:1
```

Notice that the drive specifications can be

changed to comply with your configuration. With the current version of Small C, you must specify the drives that library files exist on if you use more than one library file. It is a good idea to specify them anyway, even if you will only be using the standard C/LIB file. Also remember that the companion /NDX files for the /LIB files must exist on the same drives as their counterpart (i.e., C/LIB and C/NDX must be on the same drive).

Testing the Long Functions

As a much more practical example of the use of our new long integer functions, Program Listing One is a Small C program called LONGTEST/C, which can be compiled to a program called LONGTEST/CMD by using the command lines:

```
scc LONGTEST:1 -12 -p -a
sccopt LONGTEST:1 -m
mac -nm LONGTEST:1
smlnk LONGTEST:1 LONG/LIB:1 C/LIB:1
```

This program will first show examples of addition, subtraction, multiplication and division (and additionally using the lhexdec() and dollar() functions), and then prompt the user for a value, which it will apply to a secondary value using the longxxx() functions, plus demonstrating the use of the atoli() function.

WHAT OF FULL C?

I like Full C, or Standard C, as it is also called. Although there is a Full C compiler still available for both Model III and Model 4, I hesitate to push it, although I would most certainly like to. Not because it would be competition with CN80, with whom I have an obvious interest, but rather because the Full C package in question is currently on inventory close-out. This does not indicate a mega-cheap price, although $79.95 may be cheap for some, plus an additional $30 for the require macro assembler (plus S&H for both packages). However, what close-out means in this case is that you will receive exactly =NO SUPPORT= for the product from the seller. So if you buy it, you are on your own, and its distributor will not provide you with any help with the package beyond media defects. They have made it quite clear, in their own words, "that no warranties, support, or returns will be offered on these items." So if you have a question, you'd better be good at doing some detective work. Worse, if you decide that it is not your cup of tea, there is no way you can return it and get a refund. Besides the fact that both of those packages are printed by what looks to me like an old mimeograph, where some pages are difficult to read, it contains no organized general reference to the language, except as where the author feels it necessary. But by spending an additional 30-odd dollars you can buy a good language reference from a book store. The first edition of "The C Programming Language" by Kernigham and Ritchie, which is most applicable to this particular installation, is no longer in print. The second edition covers ANSI C, which covers many aspects not supported in the Model 4 Full C package, although this package has been updated to support most of the extensions. Thus it is still a good companion book.

This is not to say that I do not like this Full C compiler! No way! I like it a lot! The "problem", if that is the proper term, is that the package is very intimidating to the new user. It does contain a wealth of examples, although they are often complex enough that the reader should be well versed in the language to really comprehend them or to really appreciate them.

The whole purpose of presenting a Small C compiler is to provide the new user with a starting point.

CALL FOR C Q&A

If you are getting into C, and you have run into a problem, such as trying to figure out how to do something, or don't understand a function, or you have come across an ingenious solution to a problem, please submit them to CN80 to share with everyone. I will try to answer the questions as best I can (there is always a solutions -- it is just a matter of finding it).

CONCLUSION

This completes my last submersion into C programming in this column to such a deep extent. Next month expect information that is applicable to a much broader range of readers. Plus, if you would like to take a break and play games on your computer, I am in the process of translating a lot of them over to Model 4 BASIC. Until next time, HAPPY COMPUTING! -David Goben

PROGRAM LISTING NUMBER ONE by David Goben

```
/*
************************************************************
**                          LONGTEST.C                    **
************************************************************
** This program demonstrates the functions in the LONG/LIB file
**
** Create LONGTEST/CMD using the following DOS commands,
** assuming that all files exist on drive 1:
**
** scc LONGTEST:1 -l2 -p -a
** sccopt LONGTEST:1 -m
** mac -nm LONGTEST:1
** smlnk LONGTEST:1 LONG/LIB:1 C/LIB:1
*/

#include <stdio.h>              /* pick up standard definitions */

int   x[2], y[2], z[2],         /* define global user variables */
      arg1[2], arg2[2],
      sign;                     /* sign used during user input */
char str1[15], str2[15],        /* storage for ASCII value text */
      str[81];

/********************
** ENTRY POSITION **
********************/
main() {
  initarg();          /* initialize variables */
  hello();            /* sign on with program banner */
  addit();            /* process addition */
  subit();            /* process subtraction */
  mulit();            /* process multiplication */
  divit();            /* process division */
  query();            /* ask for a value, then process it */
  exit(0);            /* exit to DOS with OK flag */
  }

/************************/
/* initialize variables */
/************************/
initarg() {
  x[0]=y[0]=65500; /* set x and y to 65,500 */
  arg1[0]  =59801;
  arg2[0]  =  313;
  }

/************/
/* sign on */
/************/
hello() {
  puts("*******************************\n"
       "* Test long integer routines *\n"
       "*******************************");
  }
```

Cont'd on next page.

```
/************/
/* addition */
/************/
addit() {
  printf("\nADDITION:"
         "\n%s + %s = %s\n",dollar(lhexdec(x,str1,0)),
                            dollar(lhexdec(y,str2,0)),
                            dollar(lhexdec(longadd(x,y,z),str,0)));


/***************/
/* subtraction */
/***************/
subit() {
  printf("\nSUBTRACTION:"
         "\n%s - %s = %s\n",dollar(lhexdec(x,str1,0)),
                            dollar(lhexdec(arg2,str2,0)),
                            dollar(lhexdec(longsub(x,arg2,z),str,0)));
  }

/******************/
/* multiplication */
/******************/
mulit() {
  printf("\nMULTIPLICATION:"
         "\n%s * %s = %s\n",dollar(lhexdec(x,str1,0)),
                            dollar(lhexdec(x,str2,0)),
                            dollar(lhexdec(longmul(x,y,z),str,0)));
  }

/************/
/* division */
/************/
divit() {
  longmul(x,arg1,z);          /* z = x * arg1 */
  lhexdec(z,str1,0);          /* ASCII result string from z into str1 */
  lhexdec(arg2,str2,0);       /* make text string of 313 value in str2 */
  longdiv(z,arg2,z);          /* z = z / 313 */
  lremain(arg1);               /* save remainder from longdiv to arg1 */
  lhexdec(z,str,0);           /* final result string of division to str */
  printf("\nDIVISION:"
         "\n%s / %s = %s",str1,str2,str);
  printf(", remainder %s\n",lhexdec(arg1,str,0));
  }

/*********************************************/
/* query for value, and process by value in y */
/*********************************************/
query() {
  atoli("6111",y);        /* initialize y to 6111 */

  puts("\nThis next demonstration adds, subtracts, multiplies, and"
       "\ndivides a user-entered value by 6111\n");
  while(1) {
    fputs("Enter a value from 0 to 4294967295: ",stdout);
    if(gets(str))
```

Cont'd on next page.

```
      if(isdigit(*str))    /* at least 1st must be a digit */
        break;               /* leave while(1) block */
    }
  atoli(str,x);             /* store user value in x */

/************/
/* addition */
/************/
  printf("%s + %s = %s\n",lhexdec(x,str1,0),
                          lhexdec(y,str2,0),
                          lhexdec(longadd(x,y,z),str,0));

/***************/
/* subtraction */
/***************/
  if(x[1]<0)                /* check real sign of user value */
    sign=0;                  /* make positive if was negative */
  else sign=1;              /* else allow negative result */
  longsub(x,y,z);           /* compute subtraction result */
  printf("%s - %s = %s\n",str1,str2,lhexdec(z,str,sign));

/******************/
/* multiplication */
/******************/
printf("%s * %s = %s\n",str1,str2,lhexdec(longmul(x,y,z),str,0));

/************/
/* division */
/************/
  longdiv(x,y,z);
  lremain(arg1); /* save remainder from remain[] to arg1 */
  printf("%s / %s = %s",str1,str2,lhexdec(z,str,0));
  printf(", remainder %s\n",lhexdec(arg1,str,0));
  }

/******************/
/* End Of Program */
/******************/
```

PROGRAM LISTING NUMBER TWO by Robert Knowles

```
500 'EXTEND/PRO
505 CLS
510 OPEN"E",1,"FONE0000/SEQ:1"
520 PRINT"ADD INFORMATION, WHEN DONE TYPE DONE "
530 PRINT"CHECK                BILLING              AMOUNT               DATE"
540 PRINT"NUMBER               PERIOD               PAID                 PAID"
550 LINE INPUT N$
560 IF N$="DONE" THEN 590
570 WRITE# 1,N$
580 GOTO 550
590 CLOSE
```

PROGRAM LISTING NUMBER THREE by Richard VanHouten

```
.SCC/JCL
```

Cont'd on next page.

```
//if -N
//. SYNTAX ERROR: Mus provide program name
//. Usage: DO SCC(N=program_name[,O][,VH]
//quit
//end
scc #N# -l2 -p -a
//if O
sccopt #N# -m
//end
mac -nm #N#
//if VH
smlnk #N# vh/lib c/lib
//else
smlnk #N# c/lib
//end
.Successfully Completed
//exit
```

PROGRAM LISTING NUMBER FOUR by Richard VanHouten

```
/*
** CC/C
** invoke SCC/JCL using "CC [-O] filename"
** instead of              "DO SCC(N=filename,[O])"
** -O is an optional switch to enable optimization
*/

#define CMNDI 24              /* DOS 6 command execution */

char str[81] = "DO SCC(N=";   /* command heading */

main(argc,argv)
int argc;
char *argv[];                 /* enable user entry data */
{
  if (argc==1)                /* explain if program invoked without arguments */
    usage();
  if (argc==2)
  {
    if(argv[1][0]=='-')
      usage();                /* explain if no filename given */
    else
      strcat(str,argv[1]);    /* copy filename to command line */
  }
  else
  {
    if ((argv[1][0]=='-')     /* switch given? */
    {
      if (toupper(argv[1][1])=='O')  /* if it's the 'O' switch,
      {
        strcat(str,argv[2]);  /* copy filename to command line */
        strcat(str,",O");     /* append O parameter to command line */
      }
      else
        usage();              /* unknown switch, explain usage */
    }
```

Cont'd on next page.

```
    else
      strcat(str,argv[1]);      /* more than one filename given, ignore all */
                                /* but first */
  }
  str[strlen(str)] = '\r';      /* terminate command line with return */
  _bdos(CMNDI<<8,0,0,str);
}

usage()
{
  puts("Usage:");
  puts("CC [-O] filename");
  puts("-O, if included, enables optimization");
  puts("filename is the name of the file to compile");
}
```

BOOKINV/BAS PROGRAM LISTING NUMBER FIVE by Alfred Fant.
A model 4 basic program for keeping track of you book library.

```
40 REM PROGRAMMER: Alfred Fant
41 REM FROM MICROCOMPUTING 12-82 PAGE 48
43 CLOSE:CLS:LI$=STRING$(79,"-"):SP$=STRING$(79," "):FG=7:BG=0:HI=15:UL=1:BL=18:DEFINT A-Z
60 GOSUB 3000
69 GOTO 100
80 GOSUB 99:REM single character input, lower case converted to uppercase
81 IN$=INKEY$:IF IN$="" THEN 81
82 IF ASC(IN$)=27 THEN RUN
83 IF ASC(IN$)>96 THEN IN$=CHR$(ASC(IN$)-32):REM Lower case to upper case.
84 RETURN
85 GOSUB 99:A$="":REM Input with L/C conversion until C/R.
86 IN$=INKEY$:IF IN$="" THEN 86
87 IF IN$=CHR$(13) THEN IN$=A$:RETURN ELSE IF ASC(IN$)=27 THEN RUN
88 IF ASC(IN$)>96 THEN IN$=CHR$(ASC(IN$)-32)
89 PRINT IN$;:A$=A$+IN$:GOTO 86
90 FOR I=1 TO 1000:NEXT:RETURN  '  timer
96 GOSUB 99:PRINT @ (23,34),"< ENTER >";:PRINT CHR$(17);
97 IN$=INKEY$:IF IN$="" THEN 97 ELSE CLS:RETURN
99 IN$=INKEY$:IF IN$<>"" THEN 99 ELSE PRINT CHR$(14);:RETURN
100 REM PROGRAM BOOKS
190 CLOSE:OPEN "R", 1 , "SHELVES/DAT:1", 62
200 FIELD 1,2 AS F$,20 AS A$,20 AS T$,20 AS S$
210 CLS
215 IF S>1 THEN :PRINT CHR$(16);:PRINT TOTAL"BOOKS IN LIBRARY.   CAPACITY IS"S-1;:PRINT
CHR$(17);:PRINT:PRINT
220 PRINT"MENU.          1 : NEW BOOK
230 PRINT"               2 : SEARCHES
240 PRINT"               3 : DELETE BOOK
250 PRINT"               4 : NEW LIBRARY
260 PRINT"               5 : STOP
270 PRINT
280 PRINT @ (8,0),"CHOICE? ";:GOSUB 80:CHOICE=VAL(IN$)
290 WHILE CHOICE<1 OR CHOICE>5
300 GOTO 280
310 WEND:PRINT CHOICE
320 PRINT:ON CHOICE GOSUB 350,510,1760,2030,2190
330 GOTO 190
350 REM CHOICE=1 NEW BOOK SUBROUTINE
```

Cont'd on next page.

```
360 I=0:LOOP=1
370 GET 1,1
380 S=CVI(F$)
390 WHILE LOOP=1
400 I=I+1
410 GET 1,I
420 IF A$=SPACE$(20) OR S=I THEN LOOP=0
430 WEND
440 IF S=I THEN :PRINT CHR$(16);:PRINT " LIBRARY IS FULL WITH"I-1"BOOKS ":PRINT
CHR$(17);:CLOSE:GOSUB 96:RETURN
445 PRINT"ADD A BOOK TO THE LIBRARY! ARE YOU SURE?":GOSUB 80:IF IN$="N" THEN 190
450 INPUT "AUTHOR ";AU$:LSET A$=AU$
460 INPUT "TITLE  ";TI$:LSET T$=TI$
470 INPUT "SUBJECT";SU$:LSET S$=SU$
480 PUT 1,I
490 CLOSE:RETURN
510 REM CHOICE=2 SEARCHES SUBROUTINE
520 CLS
530 INPUT "              AUTHOR";AU$
540 INPUT "              TITLE ";TI$
550 INPUT "              SUBJECT";SU$
560 PRINT
570 PRINT "HARD COPY?":GOSUB 80:P$=IN$:IF P$="Y" THEN P=1 ELSE P=0
580 PRINT
590 IF P=1 THEN LPRINT "author" TAB(26) "title" TAB (51) "subject"
600 IF P=0 THEN CLS:PRINT "author";:PRINT CHR$(17);:PRINT TAB(26);:PRINT"title";:PRINT
CHR$(17);:PRINT TAB(51);:PRINT "subject"
601 PRINT CHR$(17);
610 IF AU$="" AND TI$="" AND SU$="" THEN MENU=1
620 IF AU$<>"" AND TI$="" AND SU$="" THEN MENU=2
630 IF AU$<>"" AND TI$<>"" AND SU$="" THEN MENU=3
640 IF AU$="" AND TI$<>"" AND SU$<>"" THEN MENU=4
650 IF AU$="" AND TI$="" AND SU$<>"" THEN MENU=5
660 IF AU$="" AND TI$<>"" AND SU$="" THEN MENU=6
670 Z$=SPACE$(20):LSET Z$=AU$
680 Y$=SPACE$(20):LSET Y$=TI$
690 X$=SPACE$(20):LSET X$=SU$
700 ON MENU GOSUB 760,920,1080,1240,1410,1570
720 GOSUB 96
730 CLOSE:GOTO 190
760 REM MENU=1 SUBROUTINE
770 I=0:TOTAL=I
780 GET 1,1
790 B$=SPACE$(20)
800 S=CVI(F$)
810 WHILE S <> I
820 I=I+1
830 GET 1,I
840 IF A$<>B$ THEN B=1:TOTAL=TOTAL+1 ELSE B=0
850 IF P=1 AND B=1 THEN LPRINT A$;"      ";T$;"      ";S$
860 IF P=0 AND B=1 THEN PRINT A$;"      ";T$;"      ";S$
870 WEND
880 CLOSE
890 RETURN
920 REM MENU=2 SUBROUTINE
930 I=0:TOTLA=I
940 GET 1,1
```

Cont'd on next page.

```
950 B$=SPACE$(20)
960 S=CVI(F$)
970 WHILE S<>I
980 I=I+1
990 GET 1,I
1000 IF A$<>B$ THEN B=1:TOTAL=TOTAL+1 ELSE B=0
1010 IF P=1 AND B=1 AND A$=Z$ THEN LPRINT A$;"      ";T$;"      ";S$
1020 IF P=0 AND B=1 AND A$=Z$ THEN PRINT A$;"      ";T$;"      ";S$
1030 WEND
1040 CLOSE
1050 RETURN
1080 REM MENU=3 SUBROUTINE
1090 I=0:TOTAL=I
1100 GET 1,1
1110 B$=SPACE$(20)
1120 S=CVI(F$)
1130 WHILE S<>I
1140 I=I+1
1150 GET 1,I
1160 IF A$<>S$ THEN B=1:TOTAL=TOTAL+1 ELSE B=0
1170 IF P=1 AND B=1 AND A$=Z$ AND T$=Y$ THEN LPRINT A$;"      ";T$;"      ";S$
1180 IF P=0 AND B=1 AND A$=Z$ AND T$=Y$ THEN PRINT A$;"      ";T$;"      ";S$
1190 WEND
1200 CLOSE
1210 RETURN
1240 REM MENU=4 SUBROUTINE
1250 I=0:TOTAL=I
1260 GET 1,1
1270 B$=SPACE$(20)
1280 S=CVI(F$)
1290 WHILE S<>I
1300 I=I+1
1310 GET 1,I
1320 IF A$<>B$ THEN B=1:TOTAL=TOTAL+1 ELSE B=0
1330 IF P=1 AND B=1 AND T$=Y$ AND S$=X$ THEN LPRINT A$;"      ";T$;"      ";S$
1340 IF P=0 AND B=1 AND T$=Y$ AND S$=X$ THEN PRINT A$;"      ";T$;"      ";S$
1350 WEND
1360 CLOSE
1370 RETURN
1410 REM MENU=5 SUBROUTINE
1420 I=0:TOTAL=I
1430 GET 1,1
1440 B$=SPACE$(20)
1450 S=CVI(F$)
1460 WHILE S<>I
1470 I=I+1
1480 GET 1,I
1490 IF A$<>B$ THEN B=1:TOTAL=TOTAL+1 ELSE B=0
1500 IF P=1 AND B=1 AND S$=X$ THEN LPRINT A$;"      ";T$;"      ";S$
1510 IF P=0 AND B=1 AND S$=X$ THEN PRINT A$;"      ";T$;"      ";S$
1520 WEND
1530 CLOSE
1540 RETURN
1570 REM MENU=6 SUBROUTINE
1580 I=0:TOTAL=I
1590 GET 1,1
1600 B$=SPACE$(20)
```

Cont'd on next page.

```
1610 S=CVI(F$)
1620 WHILE S<>I
1630 I=I+1
1640 GET 1,I
1650 IF A$<>B$ THEN B=1:TOTAL=TOTAL+1 ELSE B=0
1660 IF P=1 AND B=1 AND T$=Y$ THEN LPRINT A$;"      ";T$;"      ";S$
1670 IF P=0 AND B=1 AND T$=Y$ THEN PRINT A$;"      ";T$;"      ";S$
1680 WEND
1690 CLOSE
1700 RETURN
1760 REM CHOICE=3 : DELETE BOOK SUBROUTINE
1770 PRINT"DELETE A BOOK!  ARE YOU SURE?":GOSUB 80:B$=IN$
1780 WHILE B$="Y"
1790 PRINT CHR$(16);:PRINT"REQUIRED";:PRINT CHR$(17);:INPUT "  AUTHOR ";AU$
1800 PRINT CHR$(16);:PRINT"REQUIRED";:PRINT CHR$(17);:INPUT "  TITLE  ";TI$
1810 I=0:II=0:SP$=SPACE$(20)
1820 Y$=SP$:LSET Y$=TI$
1830 Z$=SP$:LSET Z$=AU$
1840 I=0:II=0
1850 GET 1,1
1860 S=CVI(F$)
1870 WHILE S<>I
1880 I=I+1
1890 GET 1,I
1900 IF A$=Z$ AND T$=Y$ THEN PRINT "DELETE: ";A$;"      ";T$;"      ";S$
1910 IF A$=Z$ AND T$=Y$ THEN II=I:I=S
1920 IF II<>0 THEN LSET A$=SP$:LSET T$=SP$:LSET S$=SP$
1930 WEND
1940 PUT 1,II
1950 B$="N"
1960 WEND
1970 CLOSE
1980 PRINT:GOSUB 96
1990 RETURN
2030 REM CHOICE=4 : NEW LIBRARY SUBROUTINE
2040 PRINT"CLEAR THE LIBRARY!  ARE YOU SURE?":GOSUB 80:B$=IN$
2050 WHILE B$="Y"
2060 INPUT "NEW LIBRARY SIZE IN BOOKS ";SIZE:SIZE=SIZE+1
2065 SP$=SPACE$(20)
2070 LSET F$=MKI$(SIZE):LSET A$=SP$:LSET T$=SP$:LSET S$=SP$
2080 PUT 1,1
2100 FOR I=2 TO SIZE
2105 LSET F$=MKI$(I):LSET A$=SP$:LSET T$=SP$:LSET S$=SP$
2110 PUT 1,I
2120 NEXT I
2130 B$="N"
2140 WEND
2150 CLOSE
2160 RETURN
2190 REM CHOICE=5 SUBROUTINE : STOP SUBROUTINE
2200 CLOSE
2210 CLS:PRINT"ended ";:END
3000 CLS
3010 PRINT"This BOOKS program will keep track of a library of up to 2,000 books
3020 PRINT"by author, title, or subject.
3030 PRINT:PRINT"The drive used is :1, but that can be changed in line 190.
3999 GOSUB 96:RETURN
9999 PRINT CHR$(17);:END
```

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Legal	10 point
Helvetica	10 point
Optimas	10 point
Palitine	10 point
Times Roman	10 point
Palitine	12 point
Centrum	12 point
Optimis	12 point
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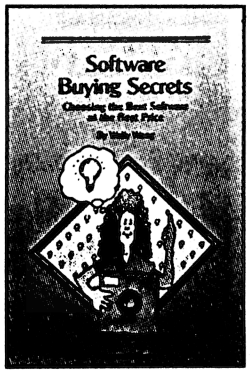

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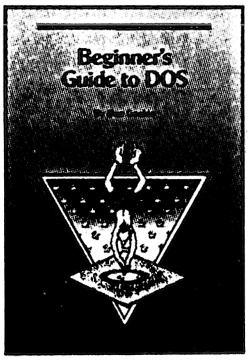

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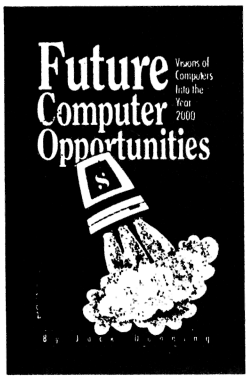

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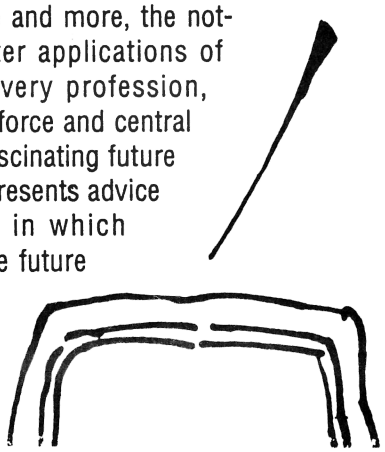

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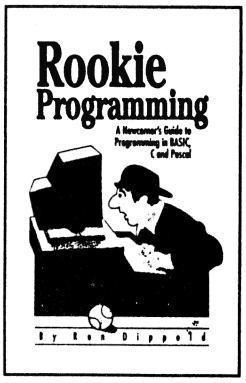

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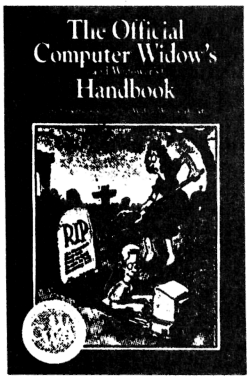

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Hundreds of Fascinating & Unique Ways to Use Your Computer

This book will explore unusual, exciting and unique software packages—ways for PC users to get enjoyment and enrichment out of owning a computer. This is the perfect book for people who are bored by their computer's dull word processing and database functions, introducing such unique computer software as bartending, gourmet cooking, gardening, and much more.

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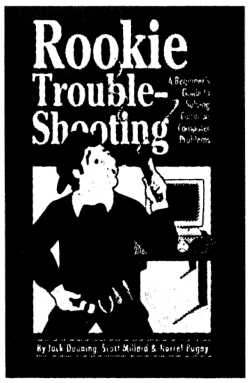

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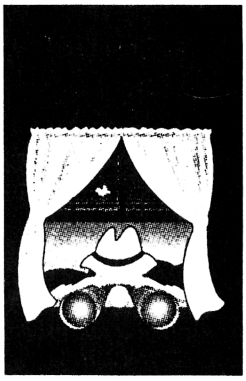

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Some ribbons for the older Radio Shack printers are not stocked, but are still available by special order, please allow an additional week shipping time. All stock ribbons are shipped within 24 hours from the time the order is received. C.O.D orders accepted. Government and educational institution purchase orders are accepted. Sorry, we do not accept credit card orders.

Sixteen Model 4 Programs!

Mark Reed's Model 4 Utility Disk now contains 16 useful utilities for every Model 4 owner:

- **CLOSE**, to close all open files on a disk;
- **CMDEDIT**, to provide command line editing and recall at "DOS Ready";
- **CMDINST**, to install CMDEDIT on the system disk in drive zero;
- **CMDSTORE**, to install CMDEDIT's special high memory storage area;
- **DSP**, to display control codes and graphics characters;
- **MAPMEM**, to list all low and high memory modules;
- **MOVE**, to transfer files from one drive to another;
- **PRINT**, to format and print text files;
- **PRT**, to print control codes and graphics characters;
- **RECLAIM**, to remove unused high memory modules;
- **SETMOD**, to set or reset files' MOD flags;
- **SETVIS**, to make files visible or invisible;
- **SWAP**, to exchange disk drive numbers;
- **UNFILTER**, to remove a filter from a device without resetting the device;
- **VLOAD**, to display specially formatted disk files; and
- **VSAVE**, to save the display to a specially formatted disk file.

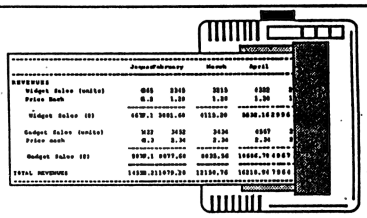
The Utility Disk comes with a help file, a 23-page manual, and full support from the author. Order your copy today for only $14.95 (plus shipping and handling) from *Computer News 80*, P.O. Box 680, Casper, WY 82602-0680.

Introducing
ED-IT for the Model 4
by Mark Allen Reed

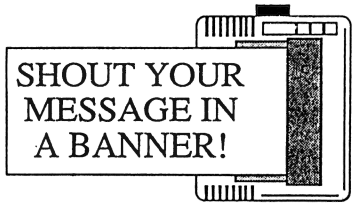
For TRSDOS 6.2 or LS-DOS 6.3. ED-IT is a brand new full-screen text editor that combines power, versatility, and ease of use. Its features include fast operation, a large text buffer (nearly 47K with no high memory modules installed), an easy-to-use menu system (activated by the <BREAK> key), three special programming modes (for assembly language, BASIC, and C), word-wrap capability, block operations (including delete, copy, move, save, and load), search operations (including find, change, change to the end of the file, repeat last find or change, and jump to specific line number), and the ability to enter any ASCII character into the document. ED-IT also allows you to execute nearly any DOS command without leaving the editor or affecting the text buffer. You can view a disk directory, purge unwanted files, even FORMAT and BACKUP from within ED-IT!

ED-IT is powerful enough for a programmer, yet simple enough for the casual user. It is excellent for editing README files, patch listings, and job control language (JCL) files. ED-IT comes with a complete instruction manual and full support from the author. Order your copy today for only $17.95 (plus shipping and handling) from *Computer News 80*, P.O. Box 680, Casper, WY 82602-0680.

LONG & LOUD!



Sideways and Banner Printing Utility for Dot-Matrix Printers



for Model 4 (TRSDOS and LSDOS)

$34.95

plus $4 per order shipping/handling

LONG: Did you ever have to print out a spreadsheet that was too wide for your printer? You spent the rest of the afternoon with scissors and tape putting all those little pieces into one useable printout. Well, *LONG* is the answer to your problem... no more cutting and taping. *LONG* twists your printer's output SIDEWAYS and prints spreadsheets (or any text file) of any width the *long* way on one continuous sheet of paper.

LOUD!: Get your message across in no uncertain terms — now you, your computer and your dot-matrix printer can shout ***HAPPY BIRTHDAY MOM*** in eight inch high letters in any of five special type styles. Create banners, signs, posters or oversize greeting cards with ease. Anything you can type can be printed *loudly* in gigantic letters!

Dot-matrix printers supported: AMT Office Printer, Anadex DP-9625B, DP-9000A, DP-9500A, DP-9001A, DP-9501A, Apple Dot Matrix Printer, Imagewriter, Imagewriter II, **Base 2, BMC MicroGraphic, Cannon PJ-1080, Centronics** 150-3, 352 and 739, C. Itoh 8510 Prowriter, 8600B, 8610 BPI, **CTI CT-80, Data General 4434, DataProducts** SPG8050, SPG8070, 8010, **DataSouth** DS-180, **Diablo** P11, C-150 Inkjet, **DEC LA50, all Epson** and compatibles, **Facit** 4510, **Genicom, Gemini** 10X/10XPC/15X, **Hewlett Packard** Thinkjet, QuietJet and HP82905, IBM Graphics printer and compatibles, QuietWriter, Proprinter, **IDS** Prism 80/132 (with Dot Plot), 445, 560, MicroPrism, JDL 750, 750C, **Legend** 880/1360, **Mannesman** Tally Spirit and MT85/86/160, **MPI** (Sprinter, Printmate 99 and 150), NEC 8023AC, P560, P565, P660, P665, P760, P765, **Okidata 82/83** (with Okigraph or PC-Write), 84, 92, 93, 192, 193, 292 and 293, **Panasonic** 1091, **Radio Shack** DMP Models 100,110,120, 200, 400, 420, 500, 2100 & CGP-220, **Tandy** DMP-130, TI 850, 855, **Toshiba** 24 pin printer.

ORDER BOTH REMBRANDT AND LONG AND LOUD FOR $ 67.50 plus $ 4.00 S/H AND SAVE!!

Computer News 80
P.O. BOX 680
CASPER, WYOMING 82602-0680

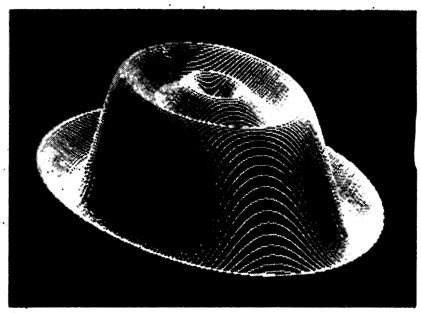
Grafyx Solution™

HIGH RESOLUTION BOARD FOR MODEL 3/4/4P/4D

Distributed by Computer News 80

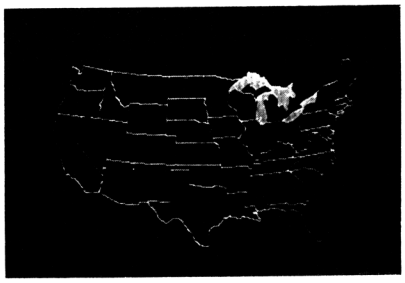
Free Draw Program Included

Hi-Resolution Graphics for Mod 4/4D/4P/III



Superior Hardware. The Grafyx Solution provides 153,600 pixel elements which are arranged in a 640 × 240 or on the Model III a 512 × 192 matrix. Hundreds of new business, personal, engineering, and educational applications are now possible. The hi-res display can be shown on top of the standard display containing text, special characters, and block graphics. This simplifies program debugging, text labeling, and upgrading current programs to use graphics. The Grafyx Solution fits completely within any tape or disk based Model 4, 4D, 4P, or III. Installation is easy with the plug-in, clip-on Grafyx Solution board.

Superior Basic. Over 20 commands are added to the Basic language. These commands will set, clear or complement points, lines, boxes, circles, ellipses, or arcs. The hi-res screen can be printed on any of 30 popular printers or saved or loaded to disk without leaving Basic. Areas may be filled in with any of 256 patterns. Sections of the screen may be saved and then put back using any of five logical functions. Labels can be printed in any direction. The viewing area can be changed. The entire screen can be complemented or cleared. Graphics Basic provides dot densities of 640 × 240, 320 × 240, 160 × 240, and 160 × 120, all of which can be used in the same display.



Superior Software. The board comes with over 40 programs and files which make it easier to use, serve as practical applications, demonstrate its capabilities, and serve as programming examples. The software works with TRSDOS 1.3, 6.1.2, 6.2, 6.3; Dosplus 3.4, 3.5, 4; LDOS; and Newdos80. The Grafyx Solution is also supported by 30 optional applications programs: Draw, Bizgraph, xT.CAD, 3D-Plot, Slideshow, Mathplot, Surface Plot, Chess, etc.

Purchase a Grafyx Solution Hi-Res Graphics Board for $ 99.00 and receive a free copy of DRAW a powerful graphics program which allows drawing or designs to be easily created on a Model III/4/4P/4D.

$ 99.00 Add (Z) S&H

Specify Model 3, Model 4p, Model 4 Gate Array, or Model 4 Non Gate Array when ordering. The boards are different for each. Please include phone number.

SAVE WITH OUR HIGH RESOLUTION COMBINATION PACKAGE NUMBER ONE

MicroLabs Grayfyx Solution Board
MicroLabs Draw Program
PostMaster Program
Hi-Res Utilities Program
PostMaster Support Utilities
Five HiRes File Cabinet Volumes

A $210.50 value if purchased seperately.

All for the Super CN80 low price of

$166.95

Add (Z) S&H

ALREADY HAVE YOUR HIGH RESOLUTION BOARD INSTALLED - THEN

SAVE WITH OUR HIGH RESOLUTION COMBINATION PACKAGE NUMBER TWO

PostMaster Program
Hi-Res Utilities Program
PostMaster Support Utilities
Five HiRes File Cabinet Volumes

A $111.50 value if purchased seperately.

All for the Super CN80 low price of

$ 75.95

Add (Z) S&H

Used Tandy **ATTENTION!** Used Tandy

New Low Prices
More Computers Than Ever!

COMPUTERS

Model 3, 2 Dr.	$135	Tandy 1000 TX	$295
Model 4, 2 Dr.	$195	Tandy 1000 SL	$245
Model 4, 2 Dr. 128 K	$235	Tandy 1000 TL	$275
Model 4P, 2 Dr.	$175	Tandy 1000 TL-2	$295
Model 12, 2 Dr.	$245	Tandy 1000 TL-3	$345
Model 4D	$345	Tandy 2000 2 FD	$ 99
Tandy 2000 HD	$245	CM-5	$ 99
Tandy 6000 HD	$595	CM-11	$135
Tandy 3000, 4000	Call	CM-2	$ 99
Tandy 1000 RL 20 Meg	$295	CM-1	$ 99
Tandy 1000 EX/HX	$145	VM 5	$ 55
Tandy 1000 A 2 FD	$135	VGM 220	$195
Tandy 1000 HD	$245	VGM 200	$225
Tandy 1000 SX	$175		

HARD DRIVES
for model 3's and 4's

Tandy 5 Meg HD.	$195	20 Meg IDE HD.	$125
Tandy 12 Meg HD.	$225	Memory 640K EX/HX	$ 95
Tandy 15 Meg HD.	$245	Memory 640K 1000	$ 95
20 Meg Hard Card	$165		

*All hard drives include cable and software.

ACCESSORIES

Tractor feed for 2100	$115	DW II sheet feeder (new)	$ 95
Tractor feed for DW II, 510	$ 95	DMP 2100 sheet feeder	$195
Tractor feed for 410 (new)	$ 39		

LAPTOPS

Model 100, 24K	$135	Tandy 1500 HD	$695
Model 200	$295	Model 102	$195
Model 600	$125	Nec 8201 16K	$ 85
Tandy 1400 LT	$375	Tandy 1400 HD	$595
Tandy 1100 FD	$395	Nec Multispeed	$275
WP-2 Port. word proc.	$135	Nec 8500	$195

PRINTERS

DMP 105, 106	$ 55	DMP 2110 24 Pin	$315
DMP 120	$ 85	DWP 210	$ 75
DMP 130	$115	DWP 410	$ 95
DMP 133	$115	DWP 510	$125
DMP 200	$ 85	DWP II	$ 95
DMP 420	$115	DWP 520	$195
DMP 430	$145	Diconix 150 Inkjet Portable	$ 95
DMP 2100 24 Pin	$145	Brother HR 5 Portable	$ 45
DMP 2100P 24 Pin	$295		

SOFTWARE

Model 4 Software

Deskmate	$ 45	Double Duty (128K req. use 2 different programs at once)	$ 19
Payroll	$ 15	Quik Pro III	$ 15
Money Decisions Business Management	$ 10	Visicalc	$ 25
Money Decisions II Real Estate and Loan Analysis	$ 10	Videotex Plus	$ 19
Inventory Control	$ 20	Basic Compiler	$ 20
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Accounts Payable	$ 25		

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Disk Course	$ 15	Time Manager	$ 10
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Profile	$ 20	Business Programs	$ 12
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Cobol	$ 19	Mini Pacs (small bus. accounting)	$ 10

*All equipment is guaranteed to be in good working order. *Equipment is cleaned and tested.
*Drives are cleaned and timed as needed.

We accept VISA & MasterCard or C.O.D. The above prices do not reflect shipping cost. Inventory changes daily; please call for availability. If you don't see what you need, please call and we will do our best to locate it for you.

PACIFIC COMPUTER EXCHANGE

The One Source For Used Tandy Equipment!
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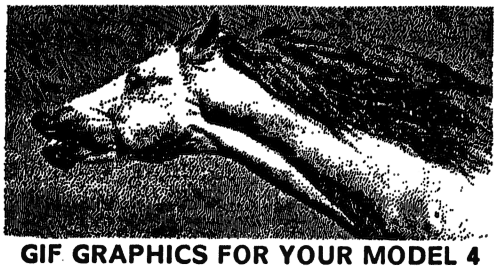


GIF GRAPHICS FOR YOUR MODEL 4

by J. F. R. "Frank" Slinkman

Send GIF (Graphics Interface Format) high resolution graphics to and receive high resolution graphics from computers of different types with your Model 4 and GIF4MOD4 program.

A high resolution board is highly recommended, but not required. If you have a high resolution graphics board GIFMOD$ will decode any GIF image up to 640 pixels x 480 pixels x 256 colors and put the image on your screen. If you do not have a hi-res board installed the program will convert the GIF format to a /HR format. Then with a High Resolution utilities packager available fro CN80 you can send the /HR picture to your printer.

This package also allows you to send GIF files.

#37.95 + (Z) S&H

I/O-BUS LD INTERFACE

for EXTERNAL FLOPPY DISK DRIVES

Add external floppy disk drives to your Model 4P - no internal wiring - plug the interface into the external 50 pin I/O connector on your 4P and plug your external disk drives into it.

Add additional floppy disk drives to your Model 4 or 4D - again just plug the interface into the 50 pin I/O bus connector and add floppy disk drive 4 & 5.

Software for TRSDOS 6.2.x and LS-DOS 6.3.x and cable included.

Controls Double-Sided 5.25 360K, 3.5 720K or Single-Sided 180K drives.

$ 180 + $4 S&H

= =

Software for LDOS 5.3.x $ 29.94 + S&H additional. For use with the Model 4 in the III mode.

ACCURATE

SIMULATION OF A

1930'S MILLS SLOT MACHINE

by J. F. R "Frank" Slinkman

Want to see a real rendition of a working slot machine on your Model 4 computer screen? Then SLOT4 is the one that will do it. True revolving dials for payoff, moving handle, with coin dropping sound.

Amuse yourself and your kids for hours on end. Entertain your guests at your next party with your computer by letting them play SLOT4.

Model 4 with High Resolution Board Required

$14.95 + (Y) S&H

Order from Computer News 80

ACCURATE

SIMULATION OF A

VIDEO POKER

MACHINE

by J. F. R "Frank" Slinkman

Play real poker on your computer with remarkable screen renditions of the playing cards. Optimum video poker strategy can be used on VIDPOKR4 or to play the real thing in Atlantic City or Nevada.

Any Poker fan will really enjoy playing against the computer, or practice the winning strategy that is included with this game package.

Model 4 with 128K and High Resolution Board Required

$19.95 (Y) S&H

Order from Computer News 80

PRINTERS FROM CN80 WITH PROVEN COMPATIBILITY

SEIKOSHA SP-2400
9 Pin Printer

80 Column Printer
300 Characters Per Second
IBM and Epson Compatible
Standard Parallel Interface
Built-In Push Tractor & Friction Feed
Easy Front Panel Controls
Paper Parking
Graphics
Two year Manufacturer's Warranty

$ 179

Add $ 6.00 S&H, Shipped by UPS only.

Fully supported by CN80 and completely compatible with PostMaster, Rembrandt, Long and Loud and all the programs, published by CN80. Will work with any Model III/4,4P or 4D computer.

SP2400 Ribbons
CN1041 $6.40 ea. $5.90 six or more.
SL-90 Ribbons
CN1046 $7.25 ea. $6.75 six or more.

SEIKOSHA SL-90 PLUS
24 Pin Printer

80 Column Printer
240 CPS draft / 80 CPS LQ
IBM and Epson Compatible
Standard Parallel Interface
Built-In Push Tractor & Friction Feed
Easy Front Panel Controls
Paper Parking
Graphics 360 Resolution
Two year Manufacturer's Warranty

$ 279

SEIKOSHA
A SEIKO GROUP COMPANY

PostMaster

Computer News 80

PostMaster by David P. Miller is a program that lets you create Posters, Letterheads and Mailing Labels with icons, borders, and many different character fonts using your dot matrix printer. The program runs on TRS-80 Model 4/4P/4D, with 64K or 128K of memory that has a MicroLabs or Radio Shack high resolution board installed.

This program has received the highest praise from reviewers of any program ever written for the Model 4. It allows you to use thousands of icons, borders, and fonts that are available from the File Cabinet Icon Library, it also allows you to add your own icons, borders and fonts.

Printers supported: Radio Shack DMP-130, -130A, -131, -132, -133, -430, -2100P, also any Radio Shack DMP printer with a 3-digit number with "3" as the second digit. All Epson and IBM printers. All other dot matrix printers that are Epson and IBM emulation printers. Seikosha SP-2000, -2000Plus, -2400. Okidata Microline 182 and 192. Panasonic KX-P1091, -1092, -1124, nonsuffixed. Star 10X, -15X, -NP, -NX, LC-10. C-ITOH 1510, 8510, C-130. (Note - Dot Matrix printers providing 300-dpi or 180-dpi may not work with PostMaster and no guarantees can be made concerning them.

Printers that are not supported are: Radio Shack DMP-110, -120, -400, -500, -2100. Panasonic suffixed printers 1124i, 1124e, etc. Okidata 82, 92, and Daisy wheel printers.

Order from Computer News 80.....$40.....add S&H (Z)

Still More Programs by David Goben

Available only from *Computer News 80*

Model 4 Small C: **For Model 4.** Program in the language of the 90's without having to memorize huge volumes of complicated manuals. Small C is a large, almost complete subset of the C programming Laguage, and ***much*** more powerful than any other Small C package previously released for CP/M or MS-DOS. C is quickly becoming the programming language of choice by beginner and vetran programmers alike. See what it's all about without it costing you and arm and a leg. The package comes complete with the Small C compiler, program optimizer, macro assembler, and linking loader, plus other programs. What's more, the ***complete*** source code for all these files (except for MAKE/CMD) is included in this package, including the ***libraries***. More than that, ***all*** these files are written in Small C! So see by real-world example practical Small C programming! Complete with 225 page reference. **$45 + S&H**

Disk Optimization Package: **For Model 4.** Quickly defragment the files on your disks or hard disks, and optimizes their storage space. Super fast operations for quick results. During normal everyday operations, you delete, create, and expand or compress files. This causes files to be broken up into several different locations on a disk. This results in slower access to your files. The included ***DIRCHECK*** program will test your drive for errors, and fix most that you may have thought were fatal. The included ***TESTFRAG*** tests a drive to see if files exist that are fragmented. ***DISKOPT*** will defragment your files, and optionally compress the disk space, to prevent easy fragmentation of files yet to be added to the drive. Full and complete support for Model 4 SubDirectories (below) included! Uses extended memory if available for even faster operation. An essential utility especially for hard disk owners. **$29.95 + S&H.**

SubDirectory Utilities: **For Model 4.** Totally eliminate the 256-file limit of a disk drive with this set of utilities. Create *additional* directories that are subordinate to a disk's normal directory, or create whole branched systems, placing only related files in each SubDirectory. This set of utilities ***DO NOT*** create large, cumbersome files on your disks. Each SubDirectory takes up only a ***very small*** amount of disk space. These SubDirectories instead share the main directory allocation map, making large support files totally unnecessary. Even create SubDirectory trees on a floppy disk! Especially handy for hard disk users who are too often plagued by running out of file "slots" in a drive ***long*** before they run out of drive space. An essential utility for those who must keep huge repositories of files, or those who would prefer to keep related programs/files in separate niches. The SubDirectory Utilities is your answer. **$19.95 + S&H**

SuperSPOOL: **For Model 4.** Increase your productivity by decreasing the time you spend waiting for your printer to finish. Allows printing in the "background" while you go on with your other computing tasks. Unlike the Model 4 SPOOL utility, **SuperSPOOL** will take advantage of all your extended memory, even if you have non-standard add-ons that have patched the DOS to support 32K banked blocks. Can use up to 1 Megabyte if you have it. On a standard 128K Model 4, this gives you a 64K printer buffer. Also unlike the DOS's SPOOL utility, **SuperSPOOL** will not lock up your computer and lose its data if the PAUSE feature is on. Even further, **SuperSPOOL** can load into *low memory*, so that those programs that cannot run with high memory routines present will operate. Using **SuperSPOOL** is like buying an expensive printer buffer device, but does not take up valuable desktop space, and costs a whole lot less. Set your printer free with **SuperSPOOL**. **$15 + S&H**

TRANSFER FILES BETWEEN Model 4/4P/4D and MS/PC

MS UTILITIES BY DAVID P. MILLER

Transfer files quickly and easily between your Model 4/4P/4D and IBM-PC Clones.

Transfer files from MS-DOS formatted disks to TRS/LSDOS formatted disks, or from TRS/LSDOS to MS-DOS formats on your Model 4 or 4P/4D.

Read MS-DOS formatted disk directories or format MS-DOS disks with your Model 4/4P/4D. Add linefeeds or strip linefeeds as needed.

$30.00 Plus S&H

David P. Miller is the author of PostMaster MS-DOS Disk operating system by MicroSoft

DAVE'S MOUSE MENU

By David P. Miller

Build a up to twenty six DOS command menu with the ability to repeat the DOS command by pressing a keyboard letter, pressing the arrow keys to "point and shoot" or use your mouse for "point and shoot" selection.

No longer do you have to memorize DOS commands and parameters that you use all the time. Simply type them in once and then select them from the menu.

Fully compatible with the use of a mouse, keyboard or arrow keys.

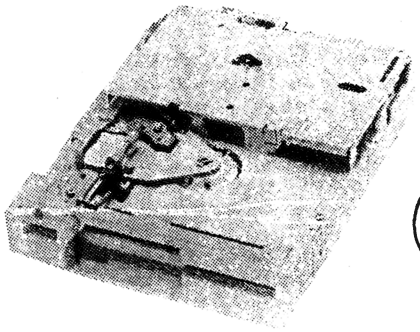
$ 15.00 Plus S&H

David P. Miller is the author of PostMaster

Refer to March 1993 CN80 (Vol. 6 No. 3) for more information about Dave's Mouse Menu.

CHINON 5.25" Floppy Disk Drive

Low Power Consumption Plus High Performance



CUSTOM IC design in the read/write and control circuits gives maximum performance and low power consumption. A pop-up mechanism protects against mischucking upon disk insertion, allowing disks to be loaded/unloaded with ease. **Chinon 5.25" floppy disk drives** provide high speed access (3 ms).

DOUBLE SIDED HAlf HEIGHT DRIVES
Install in any Model 3/4/4P/4D

CHINON 3.5" Micro Floppy

High Storage Capacity.

5-1/4" SPECIFICATIONS

360K Capacity
40 cyl. (track)

$67 each 5-1/4 or 3-1/2
Complete with installation instructions and CN80's support. Add $4 S & H per order in US.

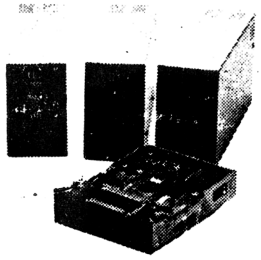
Compatible with all
Model I, III, 4/4P/4D Computers
and All their operating systems.

TWO DRIVE INTERNAL DRIVE CABLE
$10 add $2.00 S&H in US. S&H
included when ordered with drives.

3-1/2" SPECIFICATIONS

720K Capacity
80 cyl. (track)

- One Year Manufacturer's Warranty



EXTERNAL DISK DRIVES

From

Computer News 80

These external disk drives come in a metal case with power supply, power cord, and 4 ft. drive cable which plugs into the external disk drive connector on your computer. External disk drives are shipped complete via UPS ready for you to use, just plug them in and run. Plus you get our full support and two year warranty.

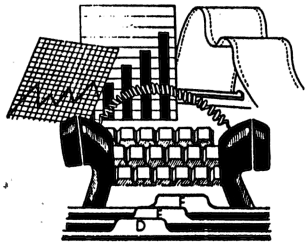
Add convenience and 720K storage space with 3-1/2 disk drives to your system. Complete with all cables ready to go at one low price.
FULL TWO YEAR WARRANTY
On all parts and labor.

ALL DISK DRIVES ARE HALF HEIGHT DOUBLE-SIDED DRIVES

One disk drive unit.....$ 143.00
with one 5-1/4 360K
or 3-1/2 720K unit.

Two disk drive unit.....$ 193.00
with two 5-1/4 360K drives
or two 3-1/2 720K drives
or one 5-1/4 and one 3-1/2 drives.

Add $ 6.00 Shipping and Handling in the US only, all others contact us for shipping costs.
CHECK OR MONEY ORDER, NO CREDIT CARDS



ANSITERM 4

by Richard VanHouten

TRS-80 Model 4 High Resolution Communications Program.

Supports ANSI (American National Standards Institute) and AVATAR control codes. IBM graphics and file transfer by X-modem or Y-modem.

System requires Model 4 with Modem and High Resolution Board.

Program complete with printed manual.

$ 30.00 (Y) S&H Order from CN80

2400 Baud External Modem

from Computer News 80

$ 78

Plus $4 S &H

2400 baud transmission speed
Hayes compatible
Compatible with Model 3/4/4D/4P
Compatible with IBM PC/XT/AT
Auto dial/answer
Eight status indicator lights
Built-in speaker with volume control
Second jack for local phone
Call progress and error detection
Ten year manufacturer's warranty
Manufactured in the USA

Complete with all cables and

TRS-80 Communication Software

CONNECTORS

DESCRIPTION	PRICE
FLAT RIBBON CABLE CONNECTORS	
50 Pin Male Edge Card Mating Connector	4.95
50 Pin 25x2 Edge Card/Female	1.75
50 Pin 25X2 Header Female/Socket	1.25
50 Pin 25x2 Header Male/Plug w/mounting	8.50
50 Pin 25x2 Header Male/Plug no mounting	8.50
36 Contact Centronics Male (Printers)	4.00
34 Pin 17x2 Header Female/Socket	1.95
34 Pin 17x2 Edge Card/Female	1.35
34 Pin 17x2 Header Male/Plug No Mounting	7.50
34 Pin 17x2 Header Male/Plug W/Mounting	7.50
25 Pin DB25 (RS232) Male/Plug	3.00
25 Pin DB25 (RS232) Female/Socket	3.00
PC BOARD MOUNT	
34 Pin 17x2 Box Header - Straight Solder	2.50
50 Pin 25x2 Box Header - Straight Solder	4.50

CONNECTOR S&H
Add $ 2.00 Shipping and Handling if ordered alone.
Shipping and Handling included if ordered with other items.

EXTENSION BLOCKS AND FLAT CABLE

DESCRIPTION	PRICE
EXTENSION CONTACT BLOCKS	
34 Pin 17x2 PCB Socket - 3/16" High	5.50
34 Pin 17x2 PCB Socket - 5/16" High	5.50
34 Pin 17x2 PCB Socket - 5/8" High	5.50

EXTENSION S&H
Add $ 2.00 Shipping and Handling if ordered alone.
Shipping and Handling included if ordered with other items.

FLAT RIBBON CABLE	
25 Conductor	.38 per ft.
34 Conductor	.51 per ft.
50 Conductor	.75 per ft.

CABLE S&H
Add $ 3.00 Shipping and Handling if ordered alone.
Shipping and Handling included if ordered with other items.

CUSTOM CABLES BUILT UPON REQUEST
Call for price quotes.

Symphony 90

Opening a new era of TRS-80 Computer Generated Music

Use the full power of your Model 4

Free Music Library Catalog with each order

for Player or Composer System

Plus a Limited Time Offer of

Free Menu Disk and Music Library Disks

Symphony 90
Music Library Catalog

Complete Catalog of Symphony 90
Music on Disks Ready to use with
the Symphony 90 Play System
$3.00 - Shipping & Handling Included

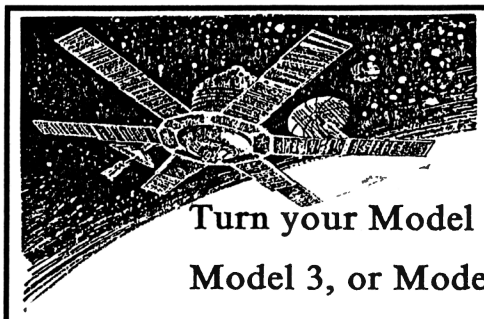
The PLAYER SYSTEM will play preprogrammed music files from the Symphony 90 Music Library or Orc-90 files. The Library Menu disk allows you to select and play all the files on a disk, or play one at a time. The COMPOSER SYSTEM allows you to write and edit your own music files. Together both Player and Composer give you a complete music system that allows you to listen to prewritten music files or to compose your own music files. But, if you only want to listen to a great variety of music compositions, then purchase only the Player System. Model III versions are also available if you do not have a Model 4.

Symphony 90
Player
Music Player Only System

Symphony 90
Composer
Music Composer System

Symphony 90 Interface with built-in amplifier and volume control. Use with your stereo amplifier and speakers, Or use with your headphones or separate speakers from the built-in amplifier.

Interface sold only with the Symphony 90 Composer or Player software. The interface is not sold separately
See Product Guide for prices.



Turn your Model 1, Model 3, or Model 4/4P/4D In to a Programmable Calculator with

ASTROCAL

by VERNON B. HESTER

Designed for the student, or professional. Engineers, lab technicians, accountants, real estate brokers, designers, anyone who does repetitive or complex mathematical calculations.

10,000 Program Storage Location, 84 Labels, 100 Addressable Memory Registers, True Algebraic Entry.

This unique product intergrates mathematical programming functions in to a single convenient application. Develop scientific, financial and statistical programs with ease.

$29.95 Add (Z) S&H

ARRANGER II

100% Machine Language Disk Index Program for the TRS-80 Model I, III, 4/4D/4P
Automatically recognizes all major TRS-80 disk operating system formats.

The ARRANGER II written by Dan Foy almost ten years ago, is a master index system that automatically records the names of your programs, what disks those programs are on and the type of disk operating system the disk was formatted under.

Program Capacity.....	11,000 programs optimum, 8,000 typical, 255 filenames per disk, 255 disks per library data file.
Disk Drive Compatibility.....	Reads 5-1/4" or 3-1/2" single-sided or double-sided; 35, 40, 80 track, and is auto self-configuration.
Functions.....	Add Delete Scan View Find (Search) Print Rename Change Update Toggle Locate Manual Backup Exit
Printouts.....	Prints out three column 8-1/2 x 11 pages with your programs listed in alphabetical order or by extensions. Prints labels with Disk:name, DOS type, and Type of disk, (system or data.)
System Requirements.....	Model I/III/4/4P/4D with one or more drives and 48K or more.

The greatest aid to keeping track of your disk library ever created for the TRS-80 computers. Your programs are printed in easy to read vertical alphabetized columns, unlike the horizontally alphabetized rows of the CAT program. You keep all your library on one disk in one library regardless of their DOS format type.

$39.95 Add (Z) S&H

HOWE SOFTWARE FOR MODEL I, III AND MODEL 4/4D/4P

Published and Distributed by Computer News 80

TYPITALL Word Processor $ 49.95

Word processor upwardly compatible with SCRIPSIT -- it reads your old SCRIPSIT files and uses the same formatting and cursor movement commands. Send any control/graphics character to the printer. Print formatted text on the screen, or send it to a disk file for later printing. Merge data from a file during printing. Assign any sequence of keystrokes to a single control key. Call up to 16 help screens at any time. Move cursor forward or backward by character, word, line, paragraph or page. Complete with easy to read manual.

TYPITALL Word Processor with Spelling Checker $ 79.95

Optional spelling checker has 29,500 word dictionary -- verify a 3.500 word document in less than two minutes.

SYSTEM DIAGNOSTIC $ 69.95

Complete tests for every component of your TRS-80 Model 1, 3, or 4 (separate versions for each model). **ROM:**checksum test. **RAM:**three tests. **Video Display:** character, video RAM, signal. **Keyboard:** every key contact tested. **Line printer:** character tests. **Disk Drives:** disk controller, drive select, track seek, read sectors, formatting, read/write/verify data with or without erasing, disk drive timer, disk head cleaner. Single/double density, single sided or double sided drives from 1 to 99 tracks. **RS-232-C Interface:** connector fault, data transmission, framing, data loop, baud rate generator. - Specify version when ordering.

SMART TERMINAL $ 19.95

The intelligent telecommunications program for TRS-80 Model 1, 3, 4 or 2/12 CP/M. Memory buffer for sending and receiving file. Automatic transmission and reception of data. Character translations, true **BREAK** key, and help screens.

HOWE SOFTWARE FOR TRS-80 AND MS-DOS SYSTEMS

SMALL BUSINESS ACCOUNTING WITH PAYROLL $ 99.95

Based on the Dome Bookkeeping Record #612, this program handles bookkeeping and payroll for a small business. Bookkeeper provides single entry ledgers for income and expenses, computes monthly and yearly summaries. Payroll handles up to 99 employees, with automatic deductions of F.I.C.A. and Federal income tax. State tax and three optional deductions also included. Prints payroll and expense checks, Form 941 reports and W-2 Forms.

MAILING LIST $ 79.95

Create and maintain mailing lists of up to 32,767 names and addresses. Up to five-line entries, including title, first and last names, optional second line, address, city, state, zip code, optional fifth line and telephone number. Sort or search for names by any field. Prints labels in 1, 2, 3, or 4 adjustable columns or on envelopes. Print form letters with any substitutions.

HOME BUDGET and CHECKBOOK ANALYST $ 49.95

A complete checkbook program combined with budget comparisons, income and expense analysis, and projections. Computes current checking balance. Also handles non-check expenses, bank debits, and income. Monthly and year-to-date summaries, yearly projections based on data up to a known month.

SMALL BUSINESS MANAGEMENT SYSTEM $ 149.95

A complete **point-of-sale** program for a small business. **Order desk** handles order entry, invoicing. Includes 1,999 8 character part numbers. **Bookkeeper** maintains general ledger. **Inventory** produces sales reports. **Installation** sets program to your business.

ADD SHIPPING AND HANDLING TO ABOVE PRICES

I D I M BULLETIN BOARD HOST SYSTEM by Leonard Lorden

IDIM (I did it my way) Bulletin Board Host System is a completely new software system written for the Model 4. It comes with a 22 page manual full of instructions on how to get started and three disks of programs for setting up your own bulletin board system, or upgrading your existing system. Many new operating features have been added to this bulletin board program by the author. For those who would like to review its features send $2 to cover the cost of mailing and we will send you a copy of the manual for your inspection.

$ 80, plus S&H.

I/O-BUS CLOCK

External Clock

$59.00
Plus S&H

Automatically install current date and time on boot up.

No soldering, no wiring, you do not have to open your computer.

Just plug the I/O-BUS CLOCK unit on the 50 pin I/O bus connector of the Model 4/4P/4D. Compatible with using a hard drive by using a 50 pin Y cable.

Unit is shipped with program for either Model 4 TRS/LS-DOS or Model 3 DOS LSDOS 5.x.x or TRSDOS 1.3.

Please specify Model 4 or Model 3 when ordering.

Disk Operating Systems

TRSDOS 1.3 disk only no manual	$ 7.00
LS-DOS 6.3.1 Upgrade disk with mini manual.	$ 39.95
LDOS 5.3.1 Upgrade disk with mini manual.	$ 39.95

Operating System and Manual.

TRSDOS 6.2.1 New original TRSDOS manuals and system disks.	$ 45.00

TRS-DOS 6.x Manuals Only

Model 4 Disk Owners Manual (Used copies no operating system disks)	$ 20.00

Plus S&H

ROM CLOCK

Internal Clock

$ 35.95
Plus S&H

ROMCLOCK Clock Chip
AND ROMCLOCK4 or 3 PROGRAM
from Computer News 80

The clock chip will install in any Model 4 or 3 computer. It provides keeping time for year, month, date, hour, minute, and seconds. Plug it in and never have to type the time and date again. It has a lithium power cell that lasts over 10 years. Complete with installation instructions and support.

ROMCLOCK4 OR ROMCLOCK3
UTILITY PROGRAM PACKAGE
by David Goben

The new clock operating program that works on SmartWatch, No-slot Clock and the CN80 ROMCLOCK. Simpler to operate and takes less memory than previous SmartWatch programs.
Complete program and manual.
$ 5.00 each add S&H

MINE FIELD

EXCITING AND NEW GAME FOR THE TRS-80 MODEL 4.

by Richard VanHouten

Cross the mine field and flag all the mines in advance of your troops without going boom yourself.

Five degrees of difficulty, the more mines you flag the higher your score.

Fully serial mouse supported, but a mouse is not required.

$ 12 plus S&H

Programs by David Goben

Available only from *Computer News 80*

David's Model 4 File Utilities: for TRSDOS/LS-DOS 6.x. Nine great file handling utilities to ensure the reliability of your files and save you *hours* of work. Of them: **DSPTXT** will allow you to view ASCII files in forward and reverse, featuring automatic word wrap, tab expansion, printed form setup, and embedded graphics. **INDEX4** will list a disk's visible files in alphabetical order, and allows you to add comments to describe them. **ERASE** totally removes all traces of a file from a disk -- ensure data security. **UNREMOVE** will recover removed, killed, and purged files. Will also list all the removed files on a disk. **SAVBAS** allows you to recover a BASIC program stored in memory after you leave BASIC (and forgot to save it). *Many other utilities.* **$9 + S&H.**

David's Model III LDOS File Utilities: for LDOS 5.x. Has the same programs as those described above, except for **SAVBAS** (not needed). Contains 8 programs. **$9 + S&H.**

David's Model 4 System Utilities: for TRSDOS/LS-DOS 6.x. 16 powerful programs to streamline your system maintenance. Featured: **XMEMDISK** is the most powerful MemDISK utility going. Maintain more than one MemDISK! **XDRIVE** will allow you to make one disk drive act like 2. **ONEPASS** is the most powerful single-pass disk duplicator ever. Even more powerful than QFB and DISKCOPY. **VERDISK** will verify the integrity of your disks. **PRINT** allows you control any printer from the DOS command prompt. *Plus many other useful utilities.* **$16 + S&H.**

David's Model III LDOS System Utilities: for LDOS 5.x. 14 powerful programs to streamline your system maintenance. Includes all programs described above, less **XMEMDISK**. Includes **VIDX** to greatly enhance your screen and character control. **$16 + S&H.**

T62DOSXT: For TRSDOS 6.2.x. Still use TRSDOS 6.2 but want to re-enable the dating? T62DOSXT will patch your system to take TRSDOS 6.2 through the end of 1999. Something that LSI, the DOS's creator said was impossible. ***FULL*** compatibility with the date format of LS-DOS 6.3. Includes numerous optional system enhancement patches. Also features **DATECONV** to upgrade disks to the new format. **ONEPASS** for disk duplication. Plus more! Unlike other patches, this package is *safe* with older disks that have not been converted. Use **T62DOSXT** with *complete* confidence. **$18 + S&H.**

PACK: For TRS-80 or MS-DOS. Pack, unpack, compress, or superpack your BASIC programs for faster operation and more efficient use of disk space. The TRS version contains both Model I/III and 4 versions. MS-DOS version requires DOS version 2 or higher. Please specify computer system when ordering. **$17.95 + S&H.**

DEA: *The Disk Editor/Assembler.* The *most powerful* integrated editor/assembler ever written. Contains both Model I/III and 4 versions. Has more enhanced features than any other. Conditional assembly, long label names, and abundant powerful math functions that are lacking in other packages. Reference addresses in, or include code from other disk files while assembling programs. These are only a small part of its many powerful features. The **DEA** package also includes a disassembler, cross reference utilities, and plentiful programming examples. **DEA** was used to write ***EVERY*** program listed in *Computer News 80* by David Goben, including **BCX, MagicDraw, Symphony 90, Diskopt, SCRIPT,** and *all* the others!

DEA: *Making Assembly Language Accessible.* **$49.95 + S&H.**

High Resolution Programs by David Goben

Available only from *Computer News 80*

MagicDraw: *Making screen design easy.* For **Model 4/4p/4d with a hi-res board and a serial mouse with mouse driver software.** No high resolution Computer-Aided Drawing program has ever been like it. Nothing comes close to the speed, ease of use, and the power offered by **MagicDraw**. ***NONE!*** If you thought drawing on the hi-res screen was too cumbersome or too difficult and that you would have to leave that kind of work to others with more experience, then *think again*. **MagicDraw** is as close to buying hi-res experience as you can get.

MagicDraw offers you *dozens* of features more than its nearest competitor. It also offers you a menu selection system that was said to be totally out of reach of a TRS-80. *Wrong!* Choosing the right tool for the job has never been so easy. No more going to help screens or digging through manuals to remember a tool's selection command; with **MagicDraw** you can do so right from an easy-to-use menu.

MagicDraw: *Realizing dreams.* **$65 + S&H.**

Hi-Res Utilities Package: for Model 4/4p/4d with a hi-res board. Take control of your hi-res artwork with this group of 10 utilities. These are the fastest hi-res utilities ever written. **HRLOAD** will load a high resolution screen file in a fraction of the time of its nearest competitor. It will load the normal **HR** files, the "crunched" **CHR** files, and super crunched **SHR** files. **HRSAVE** allows you to save hi-res screen in **HR, CHR,** and **SHR** format. **HRFXPRT** allows you to dump the hi-res screen to an Epson-compatible printer with an *incredible* variety of resolutions. **HRIBMPRT** dumps to an IBM ProPrinter-compatible printer. **HRLSRPRT** dumps to a LaserJet+ compatible printer or DeskJet printer. Seven sample files included. Other utilities allow you to clear, flip, view and shrink the screen. Take the difficulty out of processing your hi-res screens. **$15 + S&H.**

Postmaster Support Utilities: For **Model 4/4p/4d with a hi-res board and with *POSTMASTER*.** Enhance your work with David P. Miller's fantastic ***POSTMASTER*** program with this set of utilities. **MAKEICN** allows you to *capture* a portion of the screen and convert it into a ***POSTMASTER*** icon. 3 capture box sizes allows you to capture larger portions of the screen and shrink them down to icon size, if you wish to. **ADDICN** allows you to add a captured icon to a library file, which ***POSTMASTER*** can use to choose from several icons. **DSPICN** allows you to view the icons you captured. **DSPLIB** displays your ***POSTMASTER*** icon libraries. **DECDFON** and **DECDBOR** allows you to *decode* ***POSTMASTER*** font and border files so that you can edit and customize them using any text editor or word processor that can process ASCII files, such as **SCRIPT** or **EDIT-4** (both available from CN80). **ENCDFON** and **ENCDBOR** allows you to *encode* ASCII files of your own creation, or back into font and border files to make them usable by ***POSTMASTER***. **ADDFON** and **ADDBOR** allow you to combine font and border files into libraries for use by ***POSTMASTER***. Other utilities included, along with sample files. **$39 + S&H.**

POSTMASTER 24: for Model 4/4p/4d with a hi-res board and with ***POSTMASTER***. This filtering program allows you to print your ***POSTMASTER*** printouts on a 24-pin Epson-compatible printer (such as CN80's Seikosha SL-90) with super sharp ***laser quality***. Works transparently to the rest of the system, loading right along with ***POSTMASTER***, and even removing itself when you are done with ***PM***. This is a utility that has to been seen to be believed! **$15+ S&H.**

FAST System Utilities

By **David Goben**, & *only* from *Computer News 80*

Fbackup: The ***fastest*** file-by-file backup utility ever written for the Model III or Model 4/4p/4d. Designed for LDOS 5.3, TRSDOS 6.2, or LS-DOS 6.3 it's a whopping **8 TIMES FASTER** than the BACKUP/CMD program supplied with these Disk Operating Systems. Plus it has many new features: *alphabetized backups, single drive file-by-file backups,* and *more.* It will even tell you how many disks you will need. This program has to be seen to be believed. Specify Model III LDOS 5.3 or Model 4 TRSDOS 6.2/LS-DOS 6.3 on order. $15 + S&H.

Fastback: The ***fastest*** hard disk backup utility ever written for the Model III or Model 4/4p/4d. No other hard disk backup or archiving utility is faster. ***NONE!*** Don't be fool by another's claims. Selectively backup or restore files, alphabetize, even see how many disks a backup will require. As easy as **FBACKUP**, but made for those large files that normal backup disks would not be able to hold. Designed for LDOS 5.3, TRSDOS 6.2, and LS-DOS 6.3. Specify Model III or Model 4 on order. $29.95 + S&H.

Fformat: This is the ***fastest*** disk formatting program ever written. Formats a 180K disk in 18 seconds! Works like FORMAT, but with greater versatility and speed. It can even apply high level formats and verify hard disks in one step -- no more fumbling with more than one utility. A PURGE parameter allows you to reformat disks in a flash. Format 80-cylinder 2-sided disk with ease with the BIG parameter. Designed exclusively for LDOS 5.3, TRSDOS 6.2, and LS-DOS 6.3. Specify Model III or Model 4 on order. $15 + S&H.

Word Processing

by **David Goben**, & *only* from *Computer News 80*

Script: Word processor for the Model III and 4/4p/4d. ***Not*** a patch program. This is a *complete* word processor with all the features made famous by SCRIPSIT, *plus* dozens of new amenities. Powerful editing, formatting, and printing features you would expect only from packages costing much, much more. A poor person's word processor that produces professional results. Specify computer and DOS when ordering. $37.95 + S&H.

Script Spelling Verifier: For Model III and 4/4p/4d. A *powerful* spelling checker/corrector for **SCRIPT**, Disk SCRIPSIT, ALLWRITE, ASCII, TED, and other ASCII format files. Features over 75,000 words. Add up to 17,000 more words to an additional custom dictionary. Specify computer and DOS when ordering. $37.95 + S&H.

SuperScripsit Spelling Checker: For Model III and Model 4/4p/4d. Add spell checking / proofreading capabilities to SuperSCRIPSIT. Fully integrates into the word processor. Easy to install. Specify computer when ordering. $37.95 + S&H.

Model 4 Spreadsheets

Written by David Goben

Available *only* from *Computer News 80*

BCX: *The Business Calculator for Extended Memory Model 4's.*

The spreadsheet for the 90's. For Model 4 128K+. Called by its users the *friendliest* and *fastest* spreadsheet ever written for the Model 4. **No** Model 4 spreadsheet calculates faster than **BCX.** It is so fast that users have become used to keeping the automatic update feature on at all times; something you would *never* want to do with VisiCalc or Multiplan. **BCX** can calculate sales projections, income taxes, personal budgets, cost estimates, engineering changes, balance your checkbook, plus ***thousands*** of other applications. Whatever you need tabulated or computed, **BCX** can do! Play "what if" with your spreadsheets to figure your best strategies; **BCX** will remember your calculations so that when you make changes that will affect other cells, the entire spreadsheet can be *quickly* and *automatically* updated to reflect those changes, no matter how many or how drastic.

Among its numerous features are:

- **Support of up to *1 megabyte* of memory**
- **A huge 64 x 256 cell matrix (16,384) to accommodate any needs**
- **Powerful, complete set of trigonometry functions for engineers**
- **Powerful automatic table look-ups**
- **Range math that transcend simple column or row limits**
- **Read and use VisiCalc sheets with little or no change**
- **Read and use Busy-Calc sheets without changes**
- **On-line, detailed quick reference windows to jog your memory**
- **Pop-up command windows in *plain* English; no trick keywords**
- **Fast 3st screen scrolling of any spreadsheet**
- **Powerful printer options to set up any printer**
- **Huge hand-holding hands-on tutorial to help you master BCX**
- **Many powerful replication and data manipulation features**
- **A handy quick reference and a complete reference manual**

and *many more* capabilities. Has all the features users wished VisiCalc and Multiplan had. With all this power, why settle for anything less?

BCX: *The way spreadsheets should be.* $109 + S&H

Demo disk available for $15. Good toward purchase of full program.

Busy-Calc: *The Family & Small Business Spreadsheet.*

For Model 4 64K+. An economical, yet powerful and *extremely fast* spreadsheet for those who do not need huge layouts. A comfortable 64 x 64 cell matrix with powerful function, math, and reference support. Can support up to 4 banks of extended memory if you have it, though not necessary. Has most of the features of **BCX**, though simpler in structure and thus easier to use.

Busy-Calc comes complete with a reference manual featuring an extensive hand-holding, hands-on tutorial. A quick reference manual is included when you just need a refresher.

Busy-Calc: *Making spreadsheets easy.* $79.95 + S&H

Demo disk available for $10. Good toward purchase of full program.

Computer News 80

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FOR MODELS III, 4, 4P AND 4D

* **UPGRADE INSTALLATIONS**
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We give you a firm quotation on all work to be done prior to doing the work. If you do not approve your computer is returned to you. A small diagnostic fee and return shipping costs will be charged.

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Casper, WY 82609

RESTORATION SERVICE
If you have an original application program disk that needs to be restored, send it and $5.00 to cover the postage and handling. Please remember that it must be an original, legally owned by you, master disk. We will not restore copies of original program disks. There are many commercial games and other programs that we will not have in the archives, so it is best to call first and check.

FILE TRANSFER SERVICE
If you want to have your files transferred from one media to another. Such as having your files transferred from 5-1/4 disks to 3-1/2 we can do that for you. If you want to have files transferred from an IBM (MS-DOS) format to a TRSDOS/LS-DOS format, or from TRS-80 to IBM (MS-DOS) we can provide that service. However we do not have the equipment to handle 8" disks. Call or write for further details concerning the transfer service.

CP/M

Now only $140. Pickles & Trout CP/M-2.2m for your Radio Shack TRS-80 Model-II, -12, -16, or -6000 computer.

Still running "less-than-the-best?" We can upgrade your existing CP/M software (Lifeboat, P&T, ATON, Whatever) to the latest Pickles & Trout CP/M-2.2mH release, only $65. [Includes new manuals, full screen editor, full utilities, double sided disk support, and more.]

RAMD — Let your P&T CP/M use the 68000, memory as a super-speed disk drive, only $49.

REFORMATTER — Your TRSDOS system can read/write CP/M diskettes, only $49.

Looking for a CP/M program? WordStar, dBASE? Give us a call.

TriSoft

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Austin, TX 78722
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1-512-472-0744

MOUSEDOS

by Leonard Lorden

Load MOUSEDOS (Mouse Plus by David Goben is required) and select an icon from the screen display. Disk Drive Icon, displays a new menu and mini-keyboard. Write your command line. Utility Icon, displays several DOS commands and utility icons, click the mouse on the desired command icon or click the Exit icon to return to the main menu.

Included are icons for AUTO, BACKUP, BOOT, CONV, COPY, FILTER, FORMAT, FORMS, LINK, LIST, REMOVE, RENAME, RESET, ROUTE, SET, SETKI, SPOOL, SYSTEM, VERIFY.

Fancy in appearance, easy to understand and use. A must for mouse users. $ 25 plus S&H

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Double Sided Double Density
Premium Quality
by Major US Manufacturer
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Complete with labels and sleeves
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Programs as low as 15 cents each.
Order your printed catalogs today !

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MODEL 1/3 CATALOG	$2.00

Hundreds of Utility, Business, Game, Educational and Communication Programs are in each catalog.

HIGH RESOLUTION CATALOG	$2.00

Hundreds of /HR format pictures, including nudes and other artworks. Ready to use alone or create PostMaster Icons or Clip Art.

MAC/PAINT CATALOG	$2.00

Hundreds of files created with MacPaint. View on the Model 4 or print using Mac Utilities.

SYMPHONY 90 CATALOG	$3.00

Hundreds of music files ready to play.

PostMaster ICON CATALOG	Free
ALLWRITE FONTS CATALOG	Free

Disk Volume Prices: 1 to 10 Volumes $3.50 ea. (X) S&H, 11 to 20 Volumes $ 3.25 ea. (Y) S&H, 21 and over $3.00 ea. (Z) S&H. 5-1/4" or 3-1/2" disks. No extra charge for 3-1/2" disks.

Download Through The Mail

Classified Computer News 80 Classified

MODEL 3+4 public domain programs, free disk catalog, JaRick Software, 4201 71st Ave N., Brooklyn Center, MN 55429. Over 2000 to choose from Drop us a line.

FOR SALE: Model 4 w/ DS/DD drives. Mode 3 w/ SS/DD drives & Grafyx hi res board; 15 meg hard drive, 2 printers, modem, misc., original software. For complete list, send SASE to Carol Lighburne, 2230 Robinson Ave, Kingman, AZ 86401.

SELLING at rock-bottom-prices Model 3/4 software. Write for list to: R. Yves Breton, P.O. Box 83, Stn Place d'Armes, Montreal, Que, Canada H2Y 3E9

FOR SALE: Model 3 & Model 4 hardware & software. Send self addressed stamped envelope to Jim Monken, 59 E. Penning, Wood River, IL 62095 for complete list & description.

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